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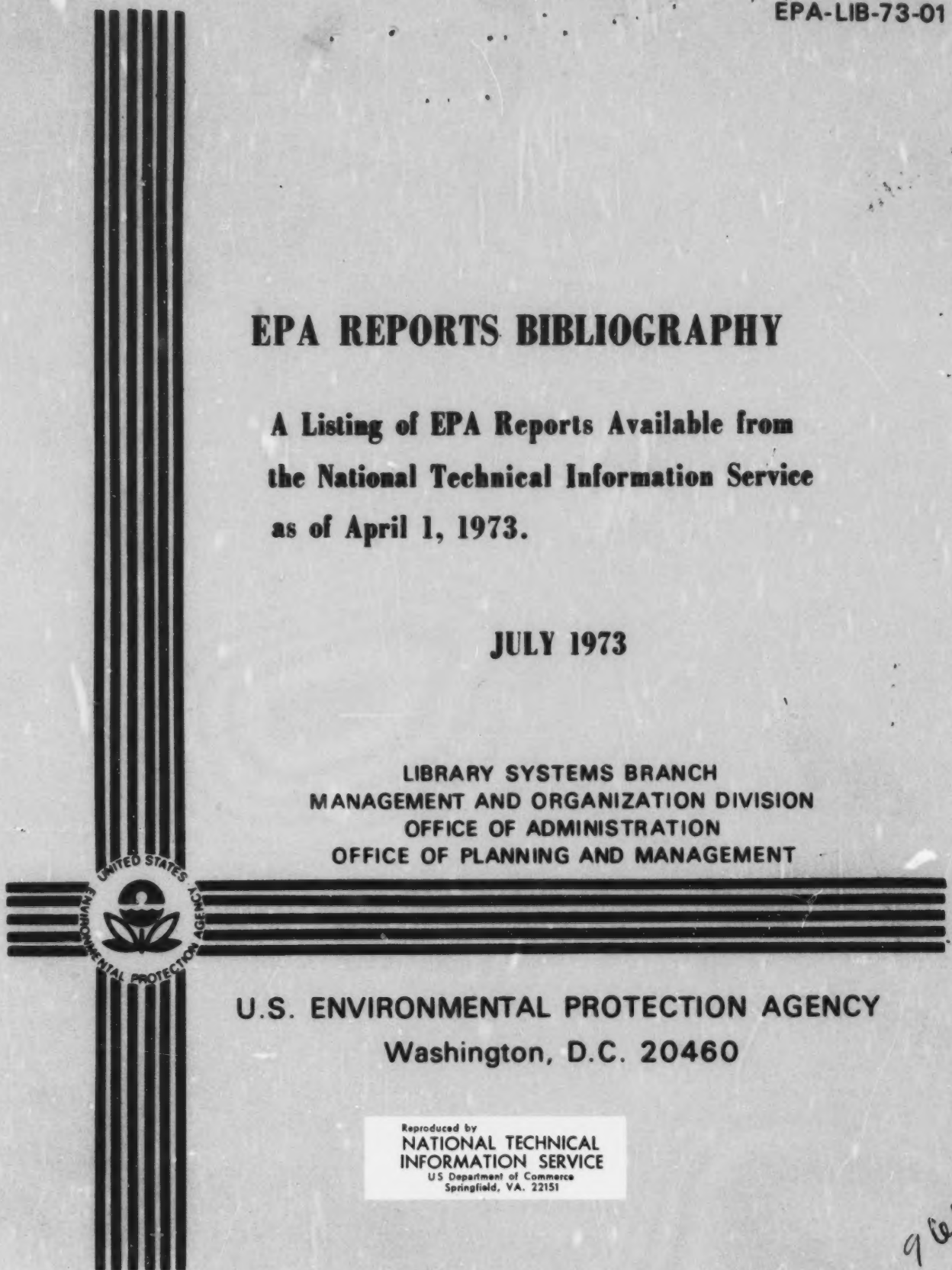

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EPA REPORTS BIBLIOGRAPHY

A Listing of EPA Reports Available From
the National Technical Information Service
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July 1973

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INTRODUCTION

This bibliography contains citations, abstracts and author, corporate source, subject, contract, and title indexes for all U. S. Environmental Protection Agency and its predecessor agencies' reports contained in the NTIS collection as of April 1, 1973. A supplement will be issued in February, 1974 to include older reports which will be identified and included in NTIS during the remainder of the calendar year, as well as all new reports issued by the EPA during this time period.

The bibliography should provide sufficient information for any user to identify any EPA report desired. Copies of the individual reports will be available from NTIS in either hard copy or on microfiche. NTIS will also provide the EPA reports in microfiche as a set; cost figures may be obtained from that office.

EPA libraries contain complete sets of microfiche on all items included in this bibliography. In addition, a complete set has been made available to 25 foreign countries which now have, or are contemplating, the establishment of an environmental agency.

EPA REPORTS BIBLIOGRAPHY

AD-607 953
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE.
Final rept.,
George W. Niles. 1 Sep 64, 36p ARPA-VUF1009

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Shoal Operation.

Project Shoal, which took place at a location near Fallon, Nevada on October 26, 1963 at 1000 PDT, was an underground nuclear detonation conducted as a part of the Vela program of the Department of Defense. The Off-Site Radiological Safety Program of the U. S. Public Health Service's Southwestern Radiological Health Laboratory monitored the public area surrounding the site and collected and analyzed several hundred water, milk and air samples before and for several weeks after the event. (Author Modified Abstract)

AD-729 582
Eastern Environmental Radiation Lab Montgomery Ala
INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS.
Technical rept.,
Stephen L. Kaufman, Mayme C. Colvin, Robert Lieberman, A. A. Moghissi, and Blair F. Rehnberg. Jun 71, 21p* Rept no. EERL-71-2

Descriptors: (*Tritium, *Metabolism), (*Phosphorescent materials, Metabolism), (*Radiation effects, Phosphorescent materials), Absorption (Biological), Tracer studies, In vivo analysis, Public health, Rats, Mammals, Half life, Skin, Gastrointestinal system.

The cutaneous and gastrointestinal tract absorption of four tritiated luminous compounds was studied in experimental animals. The percent absorption of the individual compounds via the cutaneous route varied from 0.10 to 8.83 percent and via the gastro-intestinal route from 0.67 to 21.55 percent. The data show a positive correlation between the relative absorption of the individual luminous compounds through both the cutaneous and gastrointestinal routes. Tritium activity was eliminated in two components. A slow component was seen to represent tritium activity in the form of tritiated water (HTO), while a more rapid component was thought to be tritium incorporated in other compounds soluble in urine and other body fluids. (Author)

PB-147 220
Technical Development Labs., Dept. of Health, Education and Welfare, Savannah, Ga.
COMPOSTING OF ORGANIC WASTES, AN ANNOTATED BIBLIOGRAPHY. SUPPLEMENT 1,
John S. Wiley. Jun 59, 65p
See also PB-147 219 and PB-148 097.

Descriptors: (*Composts, *Bibliographies), (*Waste disposal, Composts).
Identifiers: *Solid waste disposal.

The initial 1958 bibliography was well received and immediately brought forward numerous additional articles, largely foreign, on the subject of composting. These and other articles brought to the editor's attention have been abstracted and are included in this supplement, which is undoubtedly far from complete.

PB-148 097
Communicable Disease Center, Atlanta, Ga.
COMPOSTING OF ORGANIC WASTES. AN ANNOTATED BIBLIOGRAPHY. SUPPLEMENT 2,
John S. Wiley. Apr 60, 66p
See also PB-147 220.

Descriptors: (*Composts, *Bibliographies), (*Waste disposal, Composts).
Identifiers: *Solid waste disposal.

A third bibliography on composting supplements the initial one, published in 1958 and the first supplement, published in 1959. As before, numerous articles on this subject have appeared in the short interval since the last issue, largely foreign, for there is still more activity in both research and in plant installations in Europe than in America.

PB-168 790
Weather Bureau Research Station, Cincinnati, Ohio.
POTENTIAL DISPERSION OF PLUMES FROM LARGE POWER PLANTS,
Francis Pooler, Jr. 1965, 17p PHS-Pub-999-AP-16
Rept. on Environmental Health Series. Air Pollution.

Descriptors: (*Power plants (Establishments), Waste gases), (*Waste gases, Scattering), (*Air pollution, Power plants (Establishments)), Concentration (Chemistry), Meteorological parameters, Numerical analysis.

Expected ground-level concentrations resulting from emissions from large power plants are discussed for three meteorological situations considered to be most likely to result in significant air pollution concentrations. These situations are (1) high wind; (2) inversion breakup; and (3) limited mixing layer with a light wind. Effects of increasing stack height are discussed for each situation. Numerical examples based on calculations included as an appendix are shown. (Author)

PB-168 791
Public Health Service, Washington, D. C. Div. of Air Pollution.
ENVIRONMENTAL MEASUREMENTS: VALID DATA AND LOGICAL INTERPRETATION; SYMPOSIUM.
Jul 64, 309p PHS-Pub-999-AP-15, PHS-Pub-999-WP-15
Rept. on Environmental Health Series. Air Pollution and Water Supply and Pollution Control.

Descriptors: (*Environment, Measurement), (*Air pollution, Measurement), (*Water supplies, Measurement), Water pollution, Test equipment, Meteorological instruments, Sampling, Statistical analysis, Transducers, Experimental data, Experimental design, Information retrieval, Physiology, Data processing systems, Hydrology, Display systems, Graphics, Periodic variations, Aquatic animals, Geochemistry, Symposia.

The following papers are included: Information engineering - new frontier of technology; Objectives of measurement systems; The design of measurement systems; Parameters; Sampling and statistical design; Transducers; Classification systems for transducers and measuring systems; Data validation; The storage and retrieval of data for water quality control - summary; Data acquisition systems in air quality; Data acquistion systems in meteorology; Data acquisition systems in physiology; Data acquisition systems in water supply; Data acquisition systems in water quality control; Data acquisition systems in hydrology; The interpretation and analysis of hydrological data; Data display for analysis; Techniques for data analysis; Interpretations and conclusions; Summation; Determining basic relationships between variables; Interpretation of trends and cycles; Data interpretation (air) - drawing conclusions; The interpretation of biological data with reference to water quality; Chemistry of natural waters in relation to water quality; Data interpretation (water) - drawing conclusions.

PB-168 863
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
CONTINUOUS AIR MONITORING PROGRAM IN CINCINNATI, 1962-1963.
Jan 65, 189p PHS-Pub-999-AP-21
Rept. on CAMP.

Descriptors: (*Public health, Air pollution), (*Air pollution, Ohio), Monitors, Sulfur compounds, Dioxides, Nitrogen compounds, Oxides, Oxidizers, Hydrocarbons, Carbon monoxide, Urban areas, Instrumentation, Tables.
Identifiers: CAMP.

The report presents results of the operation of the Public Health Service Continuous Air Monitoring Program (CAMP) in Cincinnati, Ohio, during 1962 and 1963. Data on atmospheric levels of sulfur dioxide, nitric oxide, nitrogen dioxide, total oxidants, total hydrocarbons, and carbon monoxide are analyzed and discussed. The data are tabulated as hourly, daily, and monthly mean concentrations. Background information about Cincinnati and descriptions of the instrumentation are included. (Author)

PB-168 865
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
METHODS OF MEASURING AND MONITORING ATMOSPHERIC SULFUR DIOXIDE,
Seymour Hochheiser. Aug 64, 54p PHS-Pub-999-AP-6

Descriptors: (*Public health, Air pollution), (*Air pollution, Sulfur compounds), Diodes, Monitors, Measurement, Sampling, Instrumentation, Specifications, Test methods.

A literature review of methodology relating to the measurement of atmospheric sulfur dioxide, a detailed description of recommended methods, and criteria for selection of recommended methods are presented in this report. This publication is intended to serve as a resource document for those involved in measurement of pollution and in research on new or improved methods, and for those who seek to bring about widespread agreement in matters concerning measurement of pollution. (Author)

PB-168 866
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
A STUDY OF AIR POLLUTION IN THE INTERSTATE REGION OF LEWISTON, IDAHO, AND CLARKSTON, WASHINGTON.
Dec 64, 167p PHS-Pub-999-AP-8

Descriptors: (*Idaho, Air pollution), (*Washington (State), Air pollution), Waste gases, Meteorological parameters, Sulfur compounds, Odors, Wastes (Industrial), Public opinion, Law.

The purpose of the study was to determine the nature and extent of air pollution in the Lewiston-Clarkston area and to assemble information to be used as a basis for technical and official action needed to conserve air quality in the area. Because of its unique valley location, the two-city area is susceptible to meteorological conditions conductive to pollutant accumulation. Either city contaminate the other, and this creates a multijurisdictional problem that requires joint and cooperative action to control air pollution. As a first step to solve the problem, an Air Resources Management Council consisting of county, city and state officials is to be organized. This council will be responsible for planning surveys and studies to determine air quality guides and legislation and administration necessary to control air pollution in this multijurisdictional area. The Public Health Service in its advisory capacity will provide technical assistance. (Author)

PB-168 867
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION ASPECTS OF THE IRON AND STEEL INDUSTRY,
Jean J. Schueneman, M. D. High and W. E. Bye.Jun 63, 128p PHS-Pub-999-AP-1
Rept. on Environmental Health Series. Air Pollution.

Descriptors: (*Iron industry, Air pollution), (*Air pollution, Iron industry), Manufacturing methods, Furnaces, Waste gases, Control, Sintering, Public health, Law.

The report is a summary of published and other information on the air pollution aspects of the iron and steel industry, including coke plants incident thereto. Processes, equipment, and raw materials are briefly described. The magnitude and location of plants and process trends are noted. Air pollutant emissions and means for their control are discussed in detail, with respect to sintering; coke production; blast furnaces; open hearth, Besemer, electric, and basic oxygen steelmaking furnaces; and other operations. The effects of pollutants on community air quality are described, and knowledge of health aspects of pollutants is summarized. Laws regulating pollutant emissions are given, and control equipment and measures needed to comply with certain laws are listed. (Author)

PB-168 874
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ATMOSPHERIC EMISSIONS FROM FUEL OIL COMBUSTION; AN INVENTORY GUIDE,
Walter S. Smith. Nov 62, 103p PHS-Pub-999-AP-2
Rept. on Environmental Health Series. Air Pollution.

Descriptors: (*Public health, Air pollution), (*Air pollution, Fuel oil), (*Fuel oil, Air pollution), Combustion, Combustion products, Smokes, Nitrogen compounds, Oxides, Sulfur compounds, Dioxides, Particle size, Reviews.

The review provides a guide for the inventorying and control of emissions arising from the combustion of fuel oil. Information was collected from the published literature and other sources. The report is limited to information on oil used as a source of heat or power (exclusive of process heaters). The data were abstracted, assembled, and converted to common units of expression to facilitate understanding. From these data, emission factors were established that can be applied to fuel oil combustion to determine the magnitude of air-contaminating emissions. Also discussed are the compositions of fuel oils; the preparation and combustion of fuel oil; and the rates of emission, their variables, and their control. (Author)

PB-168 875
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
COMMUNITY PERCEPTION OF AIR QUALITY: AN OPINION SURVEY IN CLARKSTON, WASHINGTON,
Nahum Z. Medalia and A. L. Finkner. Jun 65, 115p PHS-Pub-999-AP-10
Rept. on Environmental Health Series. Air Pollution.

Descriptors: (*Air pollution, Public opinion), Damage, Buildings, Paints, Urban areas, Odors, Public health, Attitudes, Washington (State).

In a community with a population of 7,000 and located approximately 4 miles downwind from a pulp mill, a public opinion survey was taken to analyze the environmental stress of air pollution on a sample of household heads and spouses, along two principal attitudinal dimensions: awareness and concern. Of those interviewed, 91 percent perceived air pollution in the community as a malodor problem; 74 percent perceived it as a problem of visibility; and 62 percent as a problem of nose-throat irritation. A Guttman-type scale showed high concern with air pollution among 48 percent of the sample; low to moderate concern among 31 percent; and minimal concern among 21 percent. Although exposure to odorous pollutants in ambient air appeared roughly equal for all members of the sample, their concern with air pollution was found to vary directly with social status and attitude characteristics such as civic pride, desire to ameliorate the situation, length of residence in the community, and occupational prestige of the household head. (Author)

PB-168 876
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
AIR POLLUTION IN THE COFFEE ROASTING INDUSTRY,
Frank Partee. Sep 64, 20p PHS-Pub-999-AP-9
Rept. on Environmental Health Series.

Descriptors: (*Air pollution, Industries), (*Public health, Air pollution), (*Coffee, Processing), Emissivity, Dust, Odors, Smokes, Urban areas, Control.

The review provides a guide for the inventorying and control of emissions arising from coffee processing. Information was collected from published literature and other sources. Emission factors were established for the various processes involved, i.e. roasting, stoning, and cooling. The air pollution aspects of the production of regular grades, instant, and decaffeinated coffee are discussed. Also discussed are the types and operating characteristics of control equipment used. (Author)

PB-168 877
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
DYNAMIC IRRADIATION CHAMBER TESTS OF AUTOMOTIVE EXHAUST,
Merrill W. Korth. Nov 63, 55p PHS-Pub-999-AP-5
Rept. on Environmental Health Series. Air Pollution.

Descriptors: (*Exhaust gases, Radiation damage), (*Air pollution, Exhaust gases), Density, Exhaust systems, Test facilities, Passenger vehicles, Radiation effects, Bacteria, Plants (Botany), Animals, Fuels.

As part of an intensive study by government and private agencies the U. S. Public Health Service has built an irradiation chamber facility for investigation of irradiated auto exhaust under mixing conditions similar to those in the atmosphere. The facility consists of a programmed continuous-cycling chassis dynamometer, an exhaust dilution system, a dilution-air purification system, two irradiation chambers, and exposure facilities for evaluation of bacteria kill, plant damage, and various effects on small animals. Of the three variables studied during the first test series, the exhaust concentration at the start of irradiation appeared to produce the most significant effects. Fuel composition had a lesser influence. Very little difference was noted in the effects produced at two different average irradiation times. (Author)

PB-168 878
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE NOVEMBER-DECEMBER 1962 AIR POLLUTION EPISODE IN THE EASTERN UNITED STATES,
D. A. Lynn, B. J. Steigerwald and J. H. Ludwig.Sep 64, 30p PHS-Pub-999-AP-7
Rept. on Environmental Health Series. Air Pollution.

Descriptors: (*Air pollution, United States), Meteorological parameters, Urban areas, Public health, Gases, Contamination, Anticyclones, Atmospheric motion, Sampling.

The report documents the subject 'episode' with respect to meteorology, air quality, and public reaction. Particulate and gaseous air quality data are reported and discussed. Meteorology and public reaction are discussed with reference to the Public Health Service program of Air Pollution Potential Forecasts. Epidemiological aspects are not considered. (Author)

PB-168 879
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REACTIVITY OF ORGANIC SUBSTANCES IN ATMOSPHERIC PHOTOOXIDATION REACTIONS,
A. P. Altshuller. Jul 65, 29p PHS-Pub-999-AP-14
Rept. on Environmental Health Series. Air Pollution.

Descriptors: (*Exhaust gases, Oxidation), (*Air pollution, Organic compounds), (*Photochemistry, Organic compounds), Waste gases, Control, Toxicity, Gas analysis, Hydrocarbons, Nitrogen compounds, Oxides, Aldehydes, Ketones, Aerosols, Plants (Botany).

The organic vapors emitted to urban atmospheres by motor vehicles and other sources of emissions consist not only of paraffinic, acetylenic, aromatic, and olefinic hydrocarbons, but also of aldehydes, ketones, alcohols, phenols, and chlorinated hydrocarbons. To estimate the contribution of each of these classes of compounds to photochemical smog, one must know both their atmospheric concentrations and their relative reactivities in atmospheric reactions. Reactivities of organic substances in photooxidation reactions can be considered from many standpoints. Rates of disappearance of the organic substances, rates of disappearance of nitric oxide or of formation and disappearance of nitrogen dioxide, and rates or maximum yields of various products such as oxidant or organic nitrates all can be used as chemical measurements of reactivity. Eye irritation, various types of plant damage, and aerosol formation are indicators of reactivity that can be related only to a limited extent to chemical measurements of reactivity. The problems of developing a single index of reactivity are considered. The application of reactivity measurements to automobile exhaust composition, to control devices, and to improvements in atmospheric purity is discussed. (Author)

PB-168 888
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A PILOT STUDY OF AIR POLLUTION IN JACKSONVILLE, FLORIDA,
James P. Sheehy, John J. Henderson, Charles I. Harding and Anthony L. Danis. Apr 63, 65p PHS-Pub-999-AP-3

Descriptors: (*Air pollution, Florida), (*Public health, Air pollution), Urban areas, Fluorides, Sulfur compounds, Dioxides, Hydrogen compounds, Sulfides, Hydrocarbons, Nitrogen compounds, Oxides, Carbon dioxide, Carbon monoxide, Aldehydes, Ketones, Meteorological parameters, Damage.

The objectives of this pilot study were to develop a preliminary evaluation of air pollution in Jacksonville and to determine whether fluoride and sulfur dioxide concentrations were sufficient to cause damage to vegetation that had occurred in the area. The study consisted of an emission inventory, a meteorological investigation, an intensive short-term study of downtown Jacksonville, and an industrial area study. Pollutants sampled for included sulfur dioxide, oxidants, nitrogen dioxide, carbon monoxide, hydrogen sulfide, fluorides, and suspended particulates. During the study fluoride concentrations were high enough in certain parts of the city to cause damage to sensitive plants; sulfur dioxide and oxidants were also present at significant levels. Results of the study also indicated that photochemical smog is produced over Jacksonville, that pollutants from Jacksonville are transported across the St. John's River, and finally, that several pollutants constitute a potential problem in the city and should be evaluated further. (Author)

PB-169 670
Public Health Service, Washington, D. C. Div. of Radiological Health.

STUDIES OF THE FATE OF CERTAIN RADIONUCLIDES IN ESTUARINE AND OTHER AQUATIC ENVIRONMENTS.
Environmental health series,
Julius J. Sabo and Paul H. Bedrosian. May 63, 85p PHS-Pub-999-R-3

Descriptors: (*Radioactive waste, Rivers), (*Marine biology, Radioactive waste), (*Estuaries, Radiological contamination), Radioactive isotopes, Rivers, Radiation effects, Ecology, Health physics, Health physics instrumentation, Hydrodynamics, Silt, Sedimentation, Salinity, Radiation monitors, Symposia.

In a symposium on the fate of radionuclides in the Savannah River Estuary and in two river systems, procedures are described which can usefully be applied to investigations of other aquatic systems. The studies involve surveillance and monitoring techniques and the development of equipment and methods. A discussion of the hydraulics of the Savannah Estuary describes the characteristics of river and tidal currents and distribution of salinity and sedimentation; these form a basis for effective sampling and interpretation of radiological data and their application to aquatic and ecological data and their application to aquatic and ecological studies. Field and laboratory studies on the accumulation of nuclides by organisms are described and interrelated. It is shown that more useful information can be developed when specific nuclides, rather than gross activity, are investigated. Improvements in sampling methods, especially in silt collection, are described in detail. These studies emphasize the multidisciplinary aspects of radiological surveys of aquatic environments. (Author)

PB-169 671
Minnesota Univ., Minneapolis.
FACTORS INFLUENCING STRONTIUM-90 IN MILK FROM THE BRAINERD, MINN. MILKSHED.
Environmental health series.
Dec 62, 77p PHS-Pub-999-R-1
Prepared in cooperation with Minnesota Dept. of Health.

Descriptors: (*Milk, Radiological contamination), (*Radiological contamination, Milk), (*Strontium, Radiological contamination), Radioactive isotopes, Soils, Minnesota, Bovines, Grasses, Agriculture, Radioactive fallout, Rainfall, Health physics.

A study was undertaken to investigate consistent farm-to-farm differences in the concentrations of strontium-90 found in milk produced within a small milkshed in central Minnesota. Covering an 8-month period, the study included sampling of milk, hay, grain, silage, water, forage, soil, and precipitation. The data indicate that 70 to 90 percent of the cattle's strontium-90 intake came from the native grass hay and that the farm-to-farm differences of strontium-90 concentrations in milk correspond to similar differences of strontium-90 concentrations in the hay fed. On the basis of the data obtained, it is not possible to explain why the consistent differences in the native grass hay existed. (Author)

PB-169 672
Public Health Service, Washington, D. C. Div. of Radiological Health.
PROCEDURES FOR DETERMINATION OF STABLE ELEMENTS AND RADIONUCLIDES IN ENVIRONMENTAL SAMPLES.
Environmental health series,
C. R. Porter, R. J. Augustine, J. M. Matusek, Jr., and M. W. Carter. Jan 65, 91p PHS-Pub-999-RH-10

Descriptors: (*Radiochemistry, Radiological contamination), (*Health physics, Test methods), Instruction manuals, Chemical analysis, Radiation monitors, Radioactive isotopes, Radioactive decay, Radiation measurement systems, Food, Milk, Silt, Soils, Water, Radiobiology, Plants (Botany), Animals.

This is a manual of methods used at the Public Health Service's Southeastern Radiological Health Laboratory for the determination of stable elements and radionuclides in environmental samples. The procedures are intended for use in the processing of relatively large numbers of samples in a minimum of time for environmental radiological surveillance. The manual is divided into sections on: milk; food, biota, silt, and soil; water, and counting procedures. Appendixes cover preparation of reagents and tables of selected radionuclide decay and ingrowth factors. (Author)

PB-169 677
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SELECTED METHODS FOR THE MEASUREMENT OF AIR POLLUTANTS.
May 65, 55p PHS-Pub-999-AP-11

Descriptors: (*Air pollution, Monitors), (*Gas analysis, Air pollution), (*Public health, Air pollution), Waste gases, Atmosphere, Chemical analysis, State-of-the-art reviews, Sanitary engineering.

This manual is an effort to assist in the development of uniform standard methods of analysis of air pollutants. It makes available the judgment and knowledge of a large group of chemists in the Public Health Service. Methods of determining pollutants of common interest are presented in uniform format by chemists on the staff of the Division of Air Pollution. The methods were critically reviewed by the Interbranch Chemical Advisory Committee, which is composed of representatives of the professional chemical groups in all branches of the Division. Methods presented are as follows: For determination of sulfur dioxide, the West and Gaeke and the hydrogen peroxide methods; for determination of nitrogen dioxide and nitric oxide, the Saltzman method; for determination of oxidants, the neutral buffered-potassium iodide and the alkaline potassium iodide methods; for determination of aliphatic aldehydes, the 3-methyl-2 benzothiazolone hydrazone hydrochloride method; for determination of acrolein, the 4-hexylresorcinol method; for determination of formaldehyde, the chromotropic acid method; for determination of sulfate in atmospheric suspended particulates, the turbidimetric barium sulfate method; and for determination of nitrate in atmospheric suspended particulates, the 2, 4 xylenol method. (Author)

PB-170 475
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Lab. of Engineering and Physical Sciences.
THE TREND OF SUSPENDED PARTICULATES IN URBAN AIR: 1957-1964.
Environmental health series.
T. B. McMullen, and R. Smith. Sep 65, 28p PHS-Pub-999-AP-19

Descriptors: (*Air pollution, Particles), (*Dust, Density), Samplers, Collecting methods, Statistical analysis, Environment, Urban areas, Meteorological parameters.

The trend toward lower average concentrations of suspended particulate pollution in the urban air in the United States from 1957 through 1963, indicated by measurements of the National Air Sampling Network, is investigated from three aspects: (1) statistical significance, (2) the validity of the sampling and analytical methods, and (3) relationship to environmental changes in the vicinity of the sampling stations. The evidence indicates that the decline is real and that the methods employed can reliably detect substantive changes in the concentration of suspended particulate pollution. Information on changes in the environments of a representative group of stations revealed that where significant decreases in suspended particulates occurred, they were often logically related to specific changes in source emissions. Thus the indicated decline in the suspended particulate portion of urban air pollution is verified and substantially accounted for. A statistically significant increase in the annual mean occurred in 1964; if continued, such an increase would suggest the possibility of cyclic influences. (Author)

PB-170 701
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
AIR PARTICULATES NO. 1 STUDY NUMBER 22.
James S. Ferguson, Ronald T. Cope, and Earl F. McFarren. 1965, 85p PHSP-999-AP-22

Descriptors: (*Air pollution, Particles), (*Particles, Visual inspection), Atmosphere, Dust, Microscopes, Identification.

In the study, 35 participants each analyzed 10 slides of selected air particulates permanently mounted in a solid plasticizer. Slides 1 through 7 contained a single particulate, while slides 8 and 9 contained three each, and slide 10 contained 9 particulates. Of 770 possible correct identifications that could be made by the 35 participants analyzing the 10 slides, 247 correct identifications were made. Among the participants identifying these particulates, those using a polarizing microscope and a range of magnifications did better than those not doing so. Whereas most of the participants did reasonably well in estimating the size of the particulate on slide number 2, most did very poorly in estimating the percent by weight of each component on slides 8, 9, and 10. Although no text or standard method on identification of atmospheric particulates exists, the overall results of the study were very good. (Author)

PB-170 739
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
SURVEY OF LEAD IN THE ATMOSPHERE OF THREE URBAN COMMUNITIES.
Jan 65, 99p PHS-Pub-99-AP-12
Availability: Hard copy available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.60.

Descriptors: (*Urban areas, Air pollution), (*Air pollution, Lead compounds), (*Lead compounds, Air pollution), Fuel additives, Metalorganic compounds, Combustion products, Concentration (Chemistry), Samplers, Diurnal variations, Blood, Urine, Lead, Particles, Ohio, California, Pennsylvania.

A study of the concentrations of lead in the atmospheres of Cincinnati, Los Angeles, and Philadelphia was conducted jointly by industrial, State, Federal, and university groups during the period June 1961 through May 1962. In each city, from four to eight sampling stations, representing four geographical and land-use classifications (rural, residential, commercial, and industrial) were operated continuously with membrane filter samplers. In addition, at one station of each classification in each city, diurnal variations were investigated by use of sequential tape samplers. In each city samples of blood and urine were obtained from selected groups of residents and examined for concentrations of lead. All samples were analyzed by the dithizone method. Approximately 3,400 samples of particulate lead from the atmosphere were obtained, and the concentrations of lead in blood of approximately 2,300 individuals and of lead in urine of 1,700 males were determined. Details of the study and the results obtained are reported. (Author)

PB-170 740
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

AN AIR RESOURCE MANAGEMENT PLAN FOR THE NASHVILLE METROPOLITAN AREA.
James D. Williams, and Norman G. Edmisten. Sep 65, 154p PHS-Pub-999-AP-18

Descriptors: (*Air pollution, Tennessee), (*Natural resources, Air), (*Tennessee, Air pollution), Waste gases, Control, Management planning, Combustion products, Measurement, Samplers, Diffusion, Meteorology, Mathematical models, Public opinion.

The report is based on the numerous technical and scientific papers resulting from a major study of air pollution and effects made in Nashville, Tennessee, by the Public Health Service, Vanderbilt University, and state and local agencies during 1958-59. These papers have been supplemented by field investigations to complete the background information needed for preparation of an air resource management program plan. The report summarizes a number of the technical and scientific papers and uses all of them to develop new concepts as well as unify new and old approaches to air pollution control in preparation of the air resource management program plan. Air quality goals and the means to reach those goals are suggested. Supporting data are provided and methodology adapted for relating air quality goals to control of emissions. Methods for predicting air pollutant levels by use of mathematical models are presented. Public opinion survey results and their implications for the air resource management program are given. The report has specific use for development of an air resource management program in Nashville and general use for program development and reference in many other places. (Author)

PB-170 744
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION AND THE KRAFT PULPING INDUSTRY. AN ANNOTATED BIBLIOGRAPHY.
Paul A. Kenline, and Jeremy M. Hales. Nov 63, 124p PHS-Pub-999-AP-4

Descriptors: (*Paper industry, Air pollution), (*Air pollution, Paper industry), (*Wood pulp, Odors), Bibliographies, Abstracts, State-of-the-art reviews, Waste gases, Sulfates, Control systems, Processing.

Since the first kraft mill came into existence in 1891, the potential odor problem has been well recognized. Accordingly, a great deal of literature has been published describing practical and theoretical work in the field of kraft mill odor control. Some progress has been made, but even today most kraft mills are faced with serious problems of atmospheric pollution. An annotated bibliography is provided of articles concerning measurement and control of kraft mill air-borne pollution currently available in the literature. It is intended that this should provide a retrospective view of what has been accomplished and should form a sound basis for further work in the field. In addition to 154 abstracts, this bibliography contains a description of the kraft pulping process, a survey of mill emissions, and a consideration of control measures. (Author)

PB-170 851
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
ATMOSPHERIC EMISSIONS FROM COAL COMBUSTION AN INVENTORY GUIDE.
W. S. Smith, and C. W. Gruber. Apr 66, 114p PHS-Pub-999-AP-24
Rept. on Environmental Health Series, Air Pollution.

Descriptors: (*Air pollution, Coal), (*Coal, Combustion), Smokes, Particles, Particle size, Gases, Sulfur compounds, Nitrogen compounds, Oxides, Dioxides, Furnaces, Chemical properties, Physical properties.
Identifiers: Sulfur dioxide, Sulfur trioxide, Nitrogen oxides.

Information concerning atmospheric emissions arising from the combustion of coal was collected from the published literature and other sources. The data were abstracted, assembled, and converted to common units of expression to facilitate comparison and understanding. From these data, emission factors were established that can be applied to coal combustion processes to determine the magnitude of air pollutant emissions. Also discussed are the composition of coal, theory of coal combustion, emission rates, gaps in emission data, and future research needs. (Author)

PB-172 957
Public Health Service, Washington, D. C. Div. of Radiological Health.
SOIL AND SEDIMENT ANALYSIS: PREPARATION OF SAMPLES FOR ENVIRONMENTAL RADIATION SURVEILLANCE. PART I. PREPARATION OF SOIL SAMPLES: LABORATORY TECHNIQUES. PART II. ULTRASONIC DISPERSION OF SEDIMENTS FOR SIZE FRACTION RADIOANALYSIS.
Environmental health series.
John H. Abrahams Jr, and Raymond H. Johnson Jr. Jun 66, 33p PHS-999-RH-19

Descriptors: (*Radiological contamination, Soils), (*Soils, Radiological contamination), Sedimentation, Material separation, Ultrasonic radiation, Radioactive waste, Radiation monitors.

For surveillance studies, comparison of activity levels in soil and sediment samples is usually difficult, particularly for 'grab' samples, because of the wide variability in composition of both soil and sediment samples. Thus, radioactivity levels of sediment samples, for example, are likely to be a function of sample composition rather than of the amount of radioactivity present in the ambient water. For this reason, care at each step of the procedure--sample collection, preparation, and analysis--is vital for quantifying the radionuclide content of geologic and hydrologic materials. These studies were conducted to determine whether some active portion of a 'grab' sample, easily separated from the inert part of the sample, would provide a sensitive and reproducible indicator of radiocontamination in the environment. Although the experimental material for these studies consisted of soil and sediments from eastern Massachusetts, it is believed that, when standardized, the method will provide a useful and sensitive indicator for monitoring bottom sediments in general. (Author)

PB-173 978
Public Health Service, Washington, D. C. Div. of Radiological Health.
A COMPUTER PROGRAM FOR THE ANALYSIS OF GAMMA-RAY SPECTRA BY THE METHOD OF LEAST SQUARES,
Charles R. Phillips, Jon A. Stewart, and T. Whit Athey, III. Aug 66, 32p PHS-999-RH-21

Descriptors: (*Computer programs, *Gamma-ray spectra), Analysis, Environmental tests, Computers, Computer storage devices, Radiation monitors, Radiological contamination, Least squares method.

A computer program, written in Fortran II and Fortran IV languages for the IBM 1620 and 7040-1401 computers, respectively, is presented for the analysis of gamma-ray spectra by the method of least squares. The Fortran IV main program and four subroutines are included in appendices. The method is accurate, agreeing favorably with estimated standard deviations, and is sufficiently sensitive to be useful for routine analysis of gamma-ray spectra of a substantial number of low-activity samples. Data provided by a verification experiment show that the least squares method is more accurate than the simultaneous equations method. (Author)

PB-173 986
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
AIR POLLUTION ASPECTS OF TEPEE BURNERS USED FOR DISPOSAL OF MUNICIPAL REFUSE,
Thomas E. Kreichelt. Sep 66, 39p PHS-Pub-999-AP-28

Descriptors: (*Air pollution, Wastes (Sanitary engineering)), (*Wastes (Sanitary engineering), Disposal), Incinerators, Smokes, Garbage, Costs, Efficiency.
Identifiers: Tepee burners.

The report covers an evaluation study of air pollution emissions based upon an extensive literature search and field trips to 15 tepee burners in six states. Smoke as a function of composition and rate of charge was observed, and the effect of burner charging methods, construction, and operational procedures on smoke emissions recorded. None of the tepee incinerators observed in operation meet normal visible emission limitations of air pollution control ordinances of most municipalities. Nuisance problems from fly-ash fallout can be expected within distances of up to 1,290 feet downwind from an operating tepee. (Author)

PB-173 987
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
CONTINUOUS AIR MONITORING PROGRAM IN WASHINGTON, D. C. 1962-1963.

Sep 66, 216p PHS-Pub-999-AP-23

Descriptors: (*Air pollution, Monitors), (*Urban areas, Air pollution), Sampling, Public health, Instrumentation, Carbon monoxide, Sulfur compounds, Dioxides, Oxidizers, Hydrocarbons, Nitrogen oxides.

This report presents the results of the operation of the Public Health Service Continuous Air Monitoring Program (CAMP) in Washington, D. C., during 1962 and 1963. Data on atmospheric levels of sulfur dioxide, oxides of nitrogen, total oxidants, total hydrocarbons, and carbon monoxide are summarized, analyzed, and discussed. The data are tabulated as hourly, daily, and monthly mean concentrations; background information about Washington and a description of the instrumentation used are included.

PB-174 327
Public Health Service, Washington, D. C. Div. of Radiological Health.
SCIENTIFIC INFORMATION RETRIEVAL SYSTEM FOR RESEARCH GRANTS.
Environmental health series,
J. J. Sabo, and S. Wieder. Oct 66, 27p PHS-999-RH-22

Descriptors: (*Information retrieval, *Radiological contamination), Scientific research, Search theory, Coding, Data, Measurement.

A method developed for the Division of Radiological Health research grants for use in retrieving scientific information readily by means either of a manual system or an automatic information processing system, or a combination of the two, is described. The principles of the method are applicable or adaptable to other programs in which scientific information retrieval is required. The system described is based on the special experiences of the Division or Radiological Health Research Grants Staff and applies to the problems characteristic of its operations. Specific examples of coding and searching are given, with special attention to needs related to program and discipline areas, as well as to scientific content. (Author)

PB-174 427
Public Health Service, Cincinnati, Ohio. Bureau of Disease Prevention and Environmental Control.
CONTROL AND DISPOSAL OF COTTON-GINNING WASTES,
1967, 104p PHS-Pub-999-AP-31
A Symposium sponsored by Department of Health, Education, and Welfare, and Department of Agriculture, held in Dallas, Texas, May 3-4, 1966.

Descriptors: (*Wastes (Industrial), Disposal), (*Cotton, Wastes (Industrial)), Air pollution, Dust, Particles, Defoliants, Pesticides, Textile industry, Symposia.

The symposium on the control and disposal of cotton-ginning wastes, held in Dallas, Texas, in May 1966, was jointly sponsored by the Division of Air Pollution, Public Health Service, U. S. Department of Health, Education, and Welfare, and the Agricultural Engineering Research Division, Agricultural Research Service, U. S. Department of Agriculture. The proceedings contain information on the following subjects: the roles of local, state, and Federal agencies in controlling air pollution; the roles of the state extension's gin and mechanization specialists; methods employed in harvesting cotton; operations and characteristics of the cotton gin; methods of collecting seed cotton trash; current gin trash disposal practices; methods of collecting lint cotton trash; air pollution study of cotton gins in Texas; defoliants and pesticides; trash collection and disposal system; design and operation of the in-line filter; considerations for determining acceptable ambient and source concentrations for particulates from cotton gins; and recommendations for needed research and development. (Author)

PB-174 452
National Sanitation Foundation, Ann Arbor, Mich.
STANDARDS OF PERFORMANCE FOR FILM BADGE SERVICES,
Donald E. Barber. Sep 66, 59p PHS-999-RH-20
Contract PHS-86-63-198

Descriptors: (*Dosimeters, *Standards), (*Radiation monitors, *Control), Measurement, Errors, Exposure, Tests, Accuracy.

Standards of performance for film badge services are of general concern to film badge services, users of these services, and regulatory agencies. A quality control program self-imposed by film badge services, but involving all of these groups, is described. Approximately 2,000 film badges were irradiated with various types and energies of radiation. Exposures ranged from 0.002 to 497 roentgens. Film badge services helped design the test procedures, submitted badges for exposure, interpreted exposures, and assisted in determining provisional performance control limits. All services were informed of the test procedures to be used in the test. These error factors are tabulated to show the accuracy of the film badge services tested. Frequency distributions of the error factors served as the basis for selection of control limits used to define acceptable performance. Administrative procedures for periodically evaluating film badge service performance and for recognizing acceptable performance are also described. (Author)

PB-174 705
National Center for Air Pollution Control, Cincinnati, Ohio.
OPTICAL PROPERTIES AND VISUAL EFFECTS OF SMOKE-STACK PLUMES,
William D. Conner, and J. Raymond Hodkinson.
1967, 95p PHS-Pub-999-AP-30
Prepared in cooperation with Virginia State Coll., Petersburg. Dept. of Physics.

Descriptors: (*Waste gases, Optical properties), (*Smokes, Optical properties), Air pollution, Test methods, Visual inspection, Standards, Meters, Optical instruments, Illumination, Particle size, Aerosols.

Two experimental smoke stacks were constructed to provide test plumes for studies of optical properties and visual effects over a wide range of illuminating and viewing conditions. Results indicate that visual effects are not intrinsic properties of the plumes but vary with the background of the plume and with illuminating and viewing conditions. Variation was much greater with white plumes than with black. Tests conducted with trained smoke inspectors showed that their evaluations of nonblack smoke plumes were significantly influenced by these variations. The angular scattering and transmission characteristics of the experimental plumes were measured and estimates of particle size derived therefrom. The study shows that the quantity of aerosols in a plume is best evaluated optically by its transmittance. Special methods for measuring the transmittance of smoke plumes objectively are discussed. The methods involve telephotometry, photography, and photometry of targets; the use of smoke guides; and laser measurements. (Author)

PB-174 706
National Center for Air Pollution Control, Cincinnati, Ohio.
SOURCES OF POLYNUCLEAR HYDROCARBONS IN THE ATMOSPHERE,
R. P. Hangebrauck, D. J. von Lehmden, and J. E. Meeker. 1967, 51p PHS-Pub-999-AP-33

Descriptors: (*Air pollution, Sources), (*Polycyclic compounds, Air pollution), (*Hydrocarbons, Air pollution), (*Waste gases, Polycyclic compounds), Wastes (Industrial), Combustion products, Exhaust gases, Emissivity, Measurement, Sampling, Statistical analysis.
Identifiers: Benzopyrenes.

Rates of emissions of polynuclear hydrocarbons were measured at several sources considered likely to produce such emissions. The sources included heat generation by combustion of coal, oil, and gas; refuse burning; industrial processes; and motor vehicles. The annual emissions of benzo (a)pyrene in the United States were estimated for each of the sources surveyed, to provide a rough gauge of the importance of each source. Small, inefficient residential coal-fired furnaces appear to be a prime source of polynuclear hydrocarbons; other sources may be of local importance. Production of polynuclear hydrocarbons was generally associated with conditions of incomplete combustion. (Author)

PB-174 707
City Coll. of the City of New York.
SELECTIONS AND TRAINING OF JUDGES FOR SENSORY EVALUATION OF THE INTENSITY AND CHARACTER OF DIESEL EXHAUST FUMES,
Amos Turk. 1967, 49p PHS-Pub-999-AP-32
Contract PH-27-66-96

Descriptors: (*Exhaust gases, *Diesel engines), Sense organs, Intensity, Sensors, Odors, Sensory mechanisms, Air pollution, Training, Personnel.

Content: Environmental conditions for sensory testing; Selection of Judges for diesel exhaust odor studies; The training of judges for diesel exhaust odor studies. (Author)

PB-174 708
National Center for Air Pollution Control, Cincinnati, Ohio.
EMISSIONS FROM COAL-FIRED POWER PLANTS: A COMPREHENSIVE SUMMARY,
Stanley T. Cuffe, and Richard W. Gerstle. 1967, 33p PHS-Pub-999-AP-35

Descriptors: (*Power plants (Establishments), *Waste gases), (*Air pollution, Power plants (Establishments)), Combustion products, Sulfur compounds, Oxides, Nitrogen oxides, Polycyclic compounds, Hydrocarbons, Particles, Formaldehyde, Carboxylic acids, Arsenic, Carbon monoxide, Coal.

A study was conducted on air pollutant emissions from the six main types of coal-burning power plants. The components tested include sulfur oxides, nitrogen oxides, polynuclear hydrocarbons, total gaseous hydrocarbons, solid particulates, formaldehyde, organic acids, arsenic, trace metals, and carbon monoxide. The report relates the effects of variables such as method of operation, type of boiler furnace and auxiliaries, reinjection of fly ash, and type of coal burned to the concentrations of gaseous and particulate pollutants in the products of combustion. (Author)

PB-174 709
National Center for Air Pollution Control, Cincinnati, Ohio.
CLIMATOLOGY OF STAGNATING ANTICYCLONES EAST OF THE ROCKY MOUNTAINS, 1936-1965,
Julius Korshover. 1967, 21p PHS-Pub-999-AP-34

Descriptors: (*Anticyclones, Air pollution), (*Air pollution, Urban areas), United States, Climatology, Meteorological charts, Meteorological parameters, Barometric pressure, Motion, Contamination, Air mass analysis.

Since stagnating anticyclones are often associated with incidents of heavy air pollution in urban areas, a 30-year climatology is presented to delineate occurrences of stagnating anticyclones in the eastern United States. Occurrences of stagnation are determined on the basis of pressure-gradient values considered with other meteorological factors. Affected areas are depicted on maps by use of a system of grid points. Data showing cases of stagnation (i.e., episodes) and total days of stagnation indicate that stagnation is most likely to occur in autumn months. (Author)

PB-175 707
National Center for Radiological Health, Rockville, Md.
DISTRIBUTION OF COBALT 60, ZINC 65, STRONTIUM 85, AND CESIUM 137 IN A FRESHWATER POND,
William A. Brungs, Jr. Mar 67, 64p PHS-Pub-999-RH-24

Descriptors: (*Lakes, *Radiological contamination), (*Radioactive waste, Distribution), Accidents, Radioactive isotopes, Cobalt, Zinc, Strontium, Cesium, Water, Radioactivity, Ecology, Aquatic animals, Tissues (Biology), Plankton, Decontamination.

Data were obtained on the physical, chemical, and ecological distribution of four radionuclides added to a small pond. The conditions were comparable to those in an accidental release of radionuclides to an impoundment. Cobalt 60, zinc 65, strontium 85, and cesium 137 were added to a 30,000-gallon pond, with a sand substrate, and containing experimental biota. After 4 days, 10 percent of the cobalt 60, 6 percent of the zinc 65, and 5 percent of the cesium 137 remained in solution. Cobalt 60 and zinc 65 were associated principally with suspended solids, and cesium 137 with bottom sediments. In general, soft parts of biota rapidly accumulated more radionuclides than hard parts, but gradually lost radioactivity as radionuclide concentrations in the water decreased. Clam and snail shells and fish bone usually accumulated zinc 65 and strontium 85 until almost the end of the experiment. The maximum observed accumulation of strontium 85 occurred in the crayfish exoskeleton. Maximum activities of the other test radionuclides were observed in the tadpoles.

PB-176 049
National Center for Radiological Health, Rockville, Md.
RADIONUCLIDE STANDARDIZATION. A BIBLIOGRAPHY,
George I. Coats. Apr 67, 42p PHS-999-RH-25

Descriptors: (*Radioactive isotopes, Standardization), Bibliographies, Counting methods, Coincidence counting, Beta particles, Gamma rays, X rays, Alpha particles, Scintillation counters, Ionization chambers, Calorimeters, Films, Standards, Calibration.

The bibliography contains references on absolute counting (23); coincidence technique, formula and corrections (41); calibration by beta and 4 pi beta methods (89), beta-gamma coincidence (32), gamma-gamma coincidence and gamma counting (27), x-ray-gamma coincidences (17), alpha-gamma coincidence (7), liquid scintillation counters (14), ion chambers and calorimeters (9), coincidence circuits (48); dead time and statistics (32); thin films (21); sample preparations, back scattering and self-absorption (30); maintenance and storage of standards (9); intercomparison of solutions (7); and general references (12). (Author)

PB-176 193
National Center for Radiological Health, Rockville, Md.
NATURAL ENVIRONMENTAL RADIOACTIVITY FROM RADON 222,
John E. Pearson. May 67, 43p PHS-PUB-999-RH-26

Descriptors: (*Radioactive isotopes, Environment), (*Radon, Environment), (*Natural radioactivity, Radon), Soils, Radium, Radioactive decay, Uranium, Plants (Botany), Atmosphere, Sampling, Statistical analysis.

Radium 226 and radon 222 were measured using a deemanation method in which the gaseous daughter, radon 222, is collected and analyzed by an alpha-scintillation method. 'Emanating radium 226' from particles of soil in clay type soils varied from 0.342x10 to the - 12th power grams per gram of dry soil to 0.690x10 to the - 12th power grams per gram. Sandy soils varied between 0.147x10 to the - 12th power to 0.244x10 to the - 12th power. Highest activity measured was 14.3x10 to the - 12th power grams of 'emanating radium 226' per gram of dry soil containing uranium ore. Emanation from ground in Champaign County, Ill., for 216 measurements, was (140 plus or minus 73) x10 to the - 18th power curies of radon 222/sq cm/sec. Other soils released similar values of radon 222 except at locations where uranium 238 is available in commercially significant amounts. Release of radon 222 from the leaves of corn (Zea mays L.) about midday and near the growth peak was approximately 2.6 times that of the soil under the corn at Argonne National Laboratory in one series of six tests. Radon 222 concentrations in the atmosphere were measured in eight series of 24-hour tests, to elevations of 16 m. Values of concentration at various times of the day are presented for the normal environmental levels. (Author)

PB-177 706
National Center for Air Pollution Control, Cincinnati, Ohio.
POWER SYSTEMS FOR ELECTRIC VEHICLES.
Environmental Health series.
1967, 324P PHS-Pub-999-AP-37
Prepared for presentation at the symposium on Power Systems for Electric Vehicles, New York, 6-8 Apr 67.

Descriptors: (*Vehicles, Electric motors), Urban planning, Impact, Traffic, Systems engineering, Thermoelectricity, Batteries + components, Fuel cells, Symposia, Air pollution, Performance (Engineering), Design.

Contents: Problems in our cities: Polluted air, tangled transit; why we think about electric vehicles; Introduction, An examination of alternatives to the gasoline engine, Impact of electric vehicles on urban problems, Impact of electric power systems on urban traffic flow, control, and facilities. Types of power sources: Reviews of system developments, including several kinds of hybrids; Introduction, Hybrid power systems for vehicles, NASA work on high-energy-density electrochemical power devices, Potential battery systems in vehicle propulsion, Battery-powered electric vehicles, Power systems for electric vehicles for military and commercial use, Fuel cell - battery power sources for electric cars, Electric vehicle research, European developments of power sources for electric vehicles. Auxiliary systems: Component developments; other aspects of the total vehicle system; Introduction, Electronic circuits for speed control and braking, The mechanical design of electric automobiles, Electrochemical systems, Separator systems. Batteries and fuel cells: Status of current research on specific energy-storage systems; how they perform, Introduction, Lead-acid batteries and electric vehicles, High-energy non-aqueous battery systems for electric vehicles, An electrically rechargeable zinc-air battery for motive power, Zinc-air batteries for the electric vehicle, Note on problems related to high-energy batteries, The atomics international sodium-air cell, Aluminum fuel cell for electric vehicles, Performance and economics of the silver-zinc battery in electric vehicles, A sodium-sulfur secondary battery, Lithium nickel-halide batteries, A state-of-the-art automotive fuel cell, Direct hydrocarbon and methanol-air fuel cells, Hydrogen-air fuel cells for vehicle propulsion. (Author)

PB-178 129
National Center for Radiological Health, Rockville, Md.
REDUCTION OF RADIATION EXPOSURE IN NUCLEAR MEDICINE.
Environmental health series,
Kenneth D. Williams, James E. Cooper, Raymond T. Moore, and Albert W. Hilberg. Aug 67, 170p* PHS-Pub-999-RH-301
Prepared in cooperation with Michigan State Univ., East Lansing. Inst. of Biology and Medicine, Contract PH-86-68-16. Proceedings of a Symposium held at the Kellogg Center for Continuous Education, Michigan State Univ., East Lansing, 7-9 Aug 67.

Descriptors: (*Nuclear radiation, Exposure), (*Radiation hazards, Radiography), Radiological contamination, Radiobiology, Radiological dosage, Radiotherapy, Radioactive isotopes, X rays, Instrumentation, Pharmacology, Quality control, Medical personnel.

Representatives from the nuclear medical community, industry, and governmental agencies attended a 3-day symposium, August 7-9, 1967, cosponsored by the National Center for Radiological Health and Michigan State University. Formal presentations, discussion sessions, and work-group reports are included in the proceedings. Representatives of the Atomic Energy Commission and the National Center for Radiological Health defined the roles of these agencies in nuclear medicine. Professionals in the field of nuclear medicine presented the progress to date in the problem areas of internal radiation dosimetry, short half-lived radionuclides, instrumentation, radiopharmaceutical quality control, and manpower development. The work-group reports contain the conclusions resulting from a full day of work-group activity. The participants evaluated the need for reducing radiation exposure from nuclear medical procedures, formulated means that might be employed to use most efficiently the administered amount of radiopharmaceutical, and concluded possible solutions to problem areas in nuclear medicine. (Author)

PB-178 143
National Center for Radiological Health, Rockville, Md.
FULL-SCALE SYSTEM FOR REMOVAL OF RADIOSTRONTIUM FROM FLUID MILK.
Environmental health series,
Sam R. Hoover, G. K. Murthy, L. F. Edmondson, R. B. Read, Jr., and H. E. Walter. Oct 67, 112p* PHS-Pub-999-RH-28
Proceedings of Seminar, 24-25 February 1965.

Descriptors: (*Milk, Decontamination), Strontium, Radioactive isotopes, Radioactivity, Ion exchange, Storage tanks, Pasteurization, pH, Nutrition, Microbiology, Automation, Quality control, Electrodialysis, Public health, Pilot plants, Removal, Efficiency.

A seminar was held simultaneously with a demonstration of a full-scale system for removing radiostrontium from fluid milk at the Producers Creamery Company, Lebanon, Mo. The removal rate of the process was better than 90 percent. The taste of the treated milk compared favorably with regular milk. Nutritional values were altered somewhat, but animal feeding studies showed no deleterious effects on growth or general health as a result of known changes in the processed milk. The system included storage tanks, ion exchange resin columns, a high-temperature short-time pasteurizer, time and step controllers, and pH controls. Papers were presented on laboratory studies of ion exchange methods, nutritional investigation of milk processed in a pilot plant, microbiological aspects of the fixed-bed process, design and operation of full-scale equipment, problems associated with designing equipment, automation of full-scale equipment, problems associated with quality control and removal efficiency, relationship of the ion exchange process to present day commercial fluid milk processing operations, and additional research and development activities considered for treatment processes. (Author)

PB-178 192
Public Health Service, Washington, D. C. Div. of Radiological Health.
RADIOACTIVE DECAY CORRECTION FACTORS,
Kenneth H. Falter. Apr 65, 211p* PHS-999-RH-12

Descriptors: (*Radioactive decay, Tables), Corrections, Tracer studies, Standards, Thorium, Neptunium, Uranium, Actinium, Yttrium, Strontium, Radioactive series, Mathematical analysis, Errors, Radium, Measurement, Radon.

Tables of correction factors for radioactive decay are presented for calculating the activity of a radioactive nuclide at a given time, given its activity at any other time. (Author)

PB-178 465
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
A SYSTEM FOR THE REGISTRATION OF RADIATION SOURCES,
Lois A. Miller. Mar 68, 87p MORP-68-3

Descriptors: (*X-ray tubes, Documentation), (*Radioactive isotopes, Documentation), Data processing systems, Radium, Inventory, Health physics, Flow charting, Punched cards, Questionnaires.

This report describes a system for registering radiation sources utilizing automatic data processing equipment. Included in the report are narrative, flow charts, forms, correspondence, and suggested frequency distribution tables. (Author)

PB-178 479
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
A COLLECTION OF RADIUM LEAK TEST ARTICLES.
Technical rept.,
Valorie Wood. Mar 68, 111p MORP-68-1

Descriptors: (*Radium, *Radiation monitors), (*Radiation hazards, Reports), Radiation measurement systems, Health physics instrumentation, Cryogenics, Helium, Containers, Radioactive

waste, Actinide series, Collecting methods, Thorium, Radon, Mathematical models.

Contents: Apparatus and method for testing radium or thorium capsule seals; Photographic technique for leak testing radium sources; A technique in testing radium sources for leakage; A technique for auto-radiographs of radium containers; A proposed method for radium leak testing by the use of the superfluid properties of helium; A new method for leak-testing sealed sources of radium-226 and thorium-228; Use of autoradiographs to detect defects in radium needles and tubes and inequalities in the distribution of the radium; Testing radium capsules for radon leakage; Radon film badge; Some defects in radium needles - their detection and some consequences; A method for testing radium containers for leakage using the well-type scintillation counter; The examination of radium containers for radon leaks; Methods used for testing radiation sources for leakage and contamination; Simple test for leaking radium sources; Daily leak checking of the entire stock in a radium safe; and An approach to leak testing of sealed radium sources.

PB-179 212
Public Health Service, Washington, DC. Div. of Radiological Health.
RAPID METHODS FOR ESTIMATING FISSION PRODUCT CONCENTRATIONS IN MILK,
B. Kahn, G. K. Murthy, C. Porter, G. R. Hagee, and G. J. Karches. 1963, 31p PHS-999-R-2

Descriptors: (*Milk, *Radiological contamination), Fission products, Iodine, Strontium, Barium, Cesium, Radioactive isotopes, Ion exchange, Gamma-ray spectroscopy.

Rapid methods are described for identifying and measuring iodine-131, strontium-89, and strontium-90 in milk by chemical separation combined with counting. The use of multichannel gamma spectroscopy is outlined for determining the gamma-emitting radionuclides cesium-137, iodine-131, and barium-140 in milk. The method for iodine-131 yield determinations within 2 to 3 hours, and is designed to measure concentrations of 100 micro-micro-curies/l. The radio-strontium procedure permits analyses of several samples simultaneously in about 5 hours; recovery in tracer studies was found to be 80 plus or minus 5%. The gamma spectroscopy determination is estimated to have accuracy of plus or minus 5-10 micro-micro-curies/l between 0 and 100 micro-micro-curies/l, and plus or minus 5-10% at higher concentrations. (Author)

PB-180 525
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
MEDICAL SURPAK.
Summary rept.
Sep 68, 30p* MORP-68-4

Descriptors: (*Dosimeters, Feasibility studies), Public health, Medical supplies, Medical personnel, Dentistry, Fluoroscopes, Radiation hazards, X rays, Health physics instrumentation, Mississippi, Rhode Island, Safety.
Identifiers: Medical surpaks.

This report documents the development and field testing of the Medical Surpak, a mailable survey packet designed to be sent to medical X-ray machine users, exposed by them, and returned to a health agency for processing and evaluation of possible radiation hazards. The Medical Surpak is used to provide estimates of X-ray beam size and symmetry, total filtration, Roentgen output, and half-value layer. The design, cost data, interpretation of results, field trials, and future use are discussed. (Author)

PB-180 526
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
PRELIMINARY RESULTS OF 5263 X-RAY PROTECTION SURVEYS OF FACILITIES WITH MEDICAL X-RAY EQUIPMENT (1962-1967),
Lawrence R. Fess, and LaVert C. Seabron. Sep 68, 35p* MORP-68-6
Revision of report dated Apr 68.

Descriptors: (*X-ray photography, *Safety), Radiation hazards, Medical personnel, Medical laboratories, X rays, Statistical analysis, Exposure, Safety devices, Medical equipment.

The results of 5263 X-ray protection surveys performed in 25 States and two territories from 1962 to 1967 are discussed. Included in the report are a profile of an 'average' medical diagnostic X-ray facility and 17 tables of facility, radiographic, and fluoroscopic data. (Author)

PB-180 527
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
A REVIEW AND ANALYSIS OF RADIUM INCIDENTS,
Earl W. Robinson, John C. Villforth, and Gary J. Wold. Sep 68, 20p* MORP-68-7

Descriptors: (*Radium, Radiological contamination), Public health, Data processing systems, Radiation hazards, Accidents, Safety, Health physics.
Identifiers: Radium incident reports.

The National Center for Radiological Health has collected and analyzed 396 radium incident reports as of January 1, 1968. A compilation of incident information is presented, together with recommended preventive measures. (Author)

PB-180 528
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
DEVELOPMENT AND EVALUATION OF AN AUTOMATIC COLLIMATOR FOR MEDICAL DIAGNOSTIC X-RAY MACHINES,
Ray L. Walchle, Harold F. Stewart, and Joseph M. Morel. Aug 68, 15p MORP-68-9

Descriptors: (*X-ray photography, *Collimators), Exposure, Dosage, Diagnostic agents, X rays, Safety, Safety devices, Medical technicians, Instrumentation.
Identifiers: Evaluation.

A prototype automatic collimator for diagnostic X-ray machines was developed by the X-ray Exposure Control Laboratory. A second prototype was developed at XECL and installed in the Clinical Center of the National Institutes of Health for clinical evaluation. Subsequent use of this device has demonstrated technician acceptance. Modifications, based upon the X-ray technicians' evaluations, were made in the automatic collimator installed at the NIH. (Author)

PB-180 718
National Center for Radiological Health, Rockville, Md.
COMMON LABORATORY INSTRUMENTS FOR MEASUREMENT OF RADIOACTIVITY.
Interlaboratory Technical Advisory Committee rept. no. 2,
D. Edward Rushing, Robert W. Coulter, Joseph C. Drobinski, Jr., Charles R. Phillips, and Donald G. Remark. Apr 67, 106p*

Descriptors: (*Radiation measurement systems, Reports), Electronic equipment, Programming (Computers), Proportional counters, Geiger counters, Scintillation counters, Alpha particle detectors, Plastics, Pulse height analyzers, Gamma rays, Spectrometers, Recording systems, Crystal detectors.

This report clarifies requirements and characteristics of instrumentation used to measure levels of ionizing radiation experienced by man in his environment, and assists responsible radiological health agencies in selecting optimum surveillance and counting systems. (Author)

PB-180 955
American Academy of Arts and Sciences, Brookline, Mass.
CONFERENCE ON POVERTY AND TRANSPORTATION, JUNE 7, 1968: EDITED TRANSCRIPT.
1968, 162p*
Contract FH-11-6845
See also PB-180 956.

Descriptors: (*Economics, Symposia), (*Transportation, Symposia), Wages, Employment, Housing, Passenger vehicles, Distribution (Economics), Urban areas.
Identifiers: *Poverty, Mass transportation.

Attention at the conference focussed on the interrelationships between low income, race, housing location and transportation needs, as well as the means of alleviating transport dependence through the provision of new systems, and redesign of current systems such as mass transit, taxis, jitneys as well as novel systems. Jobs and transportation and income redistribution and transportation were well developed themes. Various experimental efforts under the Urban Mass Transportation program were described. The concern with the budgetary limitations of such programs was expressed. No definitive answers were found. Each city has unique problems but the conference yielded some common insights into the problem of providing mobility to the poor in our cities. (BPR abstract)

PB-182 254
National Center for Radiological Health, Rockville, Md.
AN ACCLIMATION ROOM FOR THE DETECTION OF LOW RADIUM 226 BODY BURDENS.
Environmental health series,
Samuel D. Campbell, and Denis E. Body. 1969, 27p PHS-Pub-999-RH-31

Descriptors: (*Health physics instrumentation, Radium), (*Radiation measurement systems, *Radium), Scintillation counters, Radon, Labeled substances, Radiological contamination, Humans, Respiratory system, Tissues (Biology), Respiration, Trailers, Laboratory equipment, Operation, Sampling, Standards, Health physics.
Identifiers: *Breath radon devices, *Alpha scintillation counters.

A mobile breath radon detection apparatus has been used for measuring low radium 226 body burdens. The unique feature of the apparatus is an acclimation room designed to accommodate subjects for periods up to 1 week in a low-radon environment. Radon concentrations in the acclimation room have been reduced to an operating level of 0.0005 pCi per liter, a reduction of approximately 600:1, by an air processing unit employing activated coconut charcoal. This apparatus permits determination of very low radium 226 body burdens in comfortable surroundings for two subjects simultaneously, during the extended periods required for elimination of previously inhaled radon from the body. The construction and operation of the acclimation room and breath sample collection are described. Radium 226 body burdens for the subjects and a radon elimination curve for one subject are included. (Author)

PB-182 261
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.

PILOT STUDY OF ULTRAVIOLET RADIATION IN LOS ANGELES OCT 1965.
Environmental Health series: Air Pollution,
John S. Nader. 1967, 98p PHS-Pub-999-AP-38

Descriptors: (*Air pollution, *Urban areas), (*Ultraviolet radiation, Attenuation), Public health, Photochemistry, Instrumentation, Periodic variations, Tables, Test facilities, Aircraft, Test methods, Meteorological parameters, California.
Identifiers: Pilot studies, Smog, Los Angeles (California).

Several research groups combined efforts to measure simultaneously the available ultraviolet radiation of the urban atmosphere of Los Angeles under representative environmental conditions. The study was planned to permit evaluation of possible methods of measuring the UV radiation important in photochemical reactions and to obtain preliminary data on the UV radiation energy with respect to location, elevation, and time of day. Measurements were made on five days at various levels of air pollution ranging from no smog to moderate-to-heavy smog. The report is a compilation of data obtained by the several participants, with brief accounts of instrumentation and procedures. The instrumental sensors used to detect the UV radiation were filter photocell, filter phototube, photochemical sensors, photosensitive plastic, and photochromic glass. Air quality and meteorological data for the sampling periods are also presented. A discussion and summary relates the data obtained in measurements by the different methods and at the various locations. (Author)

PB-182 335
Brobeck (William M.) Associates, Berkeley, Calif.
PARTICLE ACCELERATOR SAFETY MANUAL.

Oct 68, 129p* MORP-68-12
Contract PH-86-67-193
Supersedes Rpt. no. 169-1-R1 dated Jun 68, PB-178 325.

Descriptors: (*Particle accelerators, Safety), Radiobiology, Nuclear industrial applications, Nuclear radiation, Radiological contamination, Radiation monitors, Warning systems, Safety devices, Instrumentation, Shielding, Radioactivation analysis, Hazards, Fire safety, Explosions, Instruction manuals.
Identifiers: Safety engineering.

The purpose of this Manual is to alert the reader to the various hazards and recommend safe practices for common types of accelerators found in the fields of medicine, industry and research. Through the use of this Manual, persons relatively unfamiliar with particle accelerators should be able to identify a specific machine and review the safety considerations of the installation. (Author)

PB-182 558
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
RADIATION SAFETY RECOMMENDATIONS FOR X-RAY DIFFRACTION AND SPECTROGRAPHIC EQUIPMENT,
Thomas M. Moore, and Donald J. McDonald. Oct 68, 20p* MORP-68-14

Descriptors: (*Radiation hazards, *Safety), (*X-ray diffraction analysis, Safety), (*X-ray spectroscopy, Safety), Radiation monitors, X rays, X-ray diffraction cameras, X-ray tubes, Spectrographic cameras, Operation.

The report details radiation protection recommendations for X-ray diffraction and spectrographic equipment, including guidelines for administrative responsibilities, operating procedures, personnel monitoring, area monitoring, and safety engineering. The report is directed to operators, administrators, governmental health agencies, and manufacturers. (Author)

PB-182 717
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
THE USE OF RADIUM IN CONSUMER PRODUCTS,
Earl W. Robinson. Nov 68, 30p MORP-68-5
Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402, $0.40.

Descriptors: (*Commerce, *Radium compounds), Radiation hazards, Meters, Laboratory equipment, Clocks, Dosage, Test methods, Public relations.
Identifiers: Luminous equipment, Government surplus.

The report discusses the extent of the use of radium in products available to the public. It is an attempt to consolidate information pertaining to these products so that their potential health implications can be put into perspective. A greater awareness is needed to protect the public from potential exposure to consumer radium. The extent and hazards of the use of these products should be understood by all public health agencies. (Author)

PB-182 854
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
DENTAL X-RAY TEACHING AND TRAINING REPLICA,
Wayne R. Jameson, and Ray W. Alcox. Sep 68, 14p MORP-68-8

Descriptors: (*Dental personnel, Training devices), X Rays, Dentistry, X-Ray photography, Design, Models (Simulations), Head, Students.
Identifiers: Manikins.

This report summarizes the development of a dental X-ray teaching phantom designed for use in dental schools and schools of dental hygiene and dental assisting. Included in the report are information regarding the design and construction of DXTTR and illustrative photographs. (Author)

PB-182 855
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
RECOMMENDATIONS FOR THE SAFE OPERATION OF PARTICLE ACCELERATORS,
Walter E. Gundaker, and Richard F. Boggs. Feb 68, 18p MORP-68-2

Descriptors: (*Particle accelerators, Safety), Radiation hazards, Radiation alarms, Radiation injuries, Radiation monitors, Particle beams, Personnel, Accidents.

The report gives recommendations pertaining to the basic administration and minimum procedures that should be followed at particle accelerator facilities to insure safe operation. The recommendations are designed to supplement existing regulations and standards. The report is intended for use by radiation safety personnel and accelerator users. (Author).

PB-183 333
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
X-RAY DIFFRACTION EQUIPMENT.
Summary rept.,
Richard F. Boggs, and Thomas M. Moore. Jun 67, 12p MORP-67-5

Descriptors: (*X-ray diffraction analysis, *Radiation hazards), X-ray tubes, Safety, Radiation injuries, Eye, Hands, Operation, Maintenance, X-ray spectroscopy, Health physics.
Identifiers: *Radiation protection.

The report summarizes information which has been collected on the use, applications and hazards associated with X-ray diffraction equipment. It is intended for use by radiation safety personnel and others not directly involved with the application of this equipment. (Author)

PB-183 500
Public Health Service, Washington, D. C. Bureau of Radiological Health.
LEGAL LIABILITY AND RECOURSE FOR RADIATION INJURY,
Vincent P. Collins. 1969, 11p Seminar Paper-001
Prepared in cooperation with Rosewood General Hospital, Houston, Tex. Presented at X-Ray Exposure Control Laboratory's Seminar Program in Rockville, Md., 7 Oct 66.

Descriptors: (*Radiation injuries, Law), Radiation effects, Exposure, Costs, Radiological contamination, Accidents, Radioactive fallout, Particles, Gamma rays, Emesis.
Identifiers: Statute of limitations.

Radiation presents some distinctive complications to achieving the simple purpose of an injured party. The first problem is that of proving the injury. The problem is expanded by the trend where courts are willing to recognize interference with peace of mind as a compensable tort. Several cases in radiation injury litigation are discussed. (Author)

PB-184 003
Bureau of Radiological Health, Rockville, Md.
BIOLOGICAL ASPECTS OF LASER RADIATION. A REVIEW OF HAZARDS,
Wellington Moore, Jr. Jan 69, 18p*

Descriptors: (*Lasers, Hazards), Skin, Dosage, Eye, Thresholds (Physiology), Radiation tolerance, Safety, Pathology, Enzymes, Coherent radiation.

Concern over the hazards of exposure to laser radiation has resulted in the establishment of guidelines for human exposure by several agencies. Owing to the incompleteness of knowledge concerning biological effects, particularly long-term ones, it is not possible to set firm protection standards at this time. Current guides are based upon the minimum dose required to produce a visible lesion. These threshold values may vary depending upon the criteria by which they are measured. For the eye, threshold damage has been determined by such varying means as ophthalmoscopy, light microscopic histology, histochemical study and electroretinography. In histochemical studies, impairment of enzyme activity was apparent when the energy level of the light beam had been reduced by 10 to 15% below threshold for ophthalmoscopically visible or histologically detectable lesions. This raises the question of how damage in the human might be demonstrated below levels that are clinically apparent. (Author)

PB-184 020
Bureau of Radiological Health, Rockville, Md.
THE PROBLEM OF LARGE-AREA PLUTONIUM CONTAMINATION,
Wright W. Langham. 1968, 13p Seminar Paper-002
Presented at Seminar Program, Rockville, Md., 6 Dec 68. Prepared in cooperation with Los Alamos Scientific Lab., N. Mex. See also PB-183 500.

Descriptors: (*Radiological contamination, *Plutonium), Breeder reactors, Production, Toxic tolerances, Radiation sickness, Radiation hazards, Accidents, Ecology, Radiological dosage, Probability, Nuclear radiation.

The report presents some technical and philosophical aspects of the plutonium contamination problem and describes hazards presented by military/industrial accidents.

PB-184 095
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
RADIUM SOURCE INTEGRITY TESTING PROGRESS REPORT,
George L. Pettigrew. Feb 67, 11p MORP-67-3

Descriptors: (*Medical equipment, Radioactive waste), (*Radioactive waste, Disposal), Leakage (Fluid), Visual inspection, Radiological contamination, Decontamination, Bending, Compressive properties, Seals, Containers.

This report summarizes limited data collected from radium source testing. Source leakage and surface contamination, source decontamination and destructive bending of sources are included. Scope of additional testing of source integrity is discussed. (Author)

PB-184 096
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
RADIUM DISPOSAL PROJECT,
George L. Pettigrew. Feb 67, 10p MORP-67-2

Descriptors: (*Medical equipment, Radium), (*Radioactive waste, Disposal), United States Government, Sources, Radiological contamination.
Identifiers: *Radioactive waste disposal.

The report summarizes the radium waste disposal activities of the Radioactive Materials Section, Data, supplied with surplus sources, is tabulated with special consideration given to medical sources. Source types, age and leakage are compared. (Author)

PB-184 130
Missouri Univ., Columbia.
REPORT OF THE TASK FORCE ON X-RAY IMAGE ANALYSIS AND SYSTEMS DEVELOPMENT.

Feb 69, 123p* DMRE-69-1
Contract PH-86-67-198
Supersedes PB-179 463.

Descriptors: (*X-ray photography, Images), Diagnosis, X-ray absorption analysis, Management control systems, Information retrieval, Documentation, Photointerpretation, Visual acuity, Decision making, Flow charting, Advanced planning, Quality control.
Identifiers: Management information systems, *Radiology.

A task force of outstanding experts in radiology, engineering, and computer science was formed under Public Health Service contract with the University of Missouri. Its purpose was to study the functional organization and status of diagnostic radiology from a perspective of increasing the effectiveness of radiological systems while obtaining the maximum amount of diagnostic benefit per unit of radiation exposure. The report details the findings and recommendations of the task force. (Author)

PB-184 162
Oak Ridge National Lab., Tenn.
THE NEED FOR STANDARDIZATION PROCEDURES IN THE APPLICATION OF IONOZING RADIATION TO MEDICAL AND DENTAL PATIENTS,
Karl Z. Morgan. 1968, 21p
Presented as part of National Center for Radiological Health's Seminar Program, 15 Nov 1968, Rockville, Md.

Descriptors: (*X rays, Health physics), (*Radiobiology, Standards), Standardization, Safety, Radiation Tolerance, Exposure, Design, Radiological dosage, Medicine, Dentistry, Medical personnel, Radiation hazards, Medical equipment.

It is recognized and emphasized that ionizing radiation is one of the most valuable and essential diagnostic tools of medicine. Every effort should be made to enhance the beneficial uses of this source of energy while minimizing its harmful effects. It is estimated that more than 90% of man-made exposure to ionizing radiation arises for medical diagnosis and that a large fraction of this represents unnecessary exposure. This perhaps is what we could expect when we realize that a large fraction of those in the medical profession who authorize, supervise and administer these x-ray examinations do not have the education, training and certification in its use. As a consequence, much of the equipment and many of the techniques employed do not meet minimum standards required for the protection of the patient. By standardization of the procedures employed in the application of diagnostic x-rays for the rather routine applications, a marked reduction can be made in the patient dose while at the same time providing more and greater detailed diagnostic information on the radiogram. (Author)

PB-184 356
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
DENTAL SURPAK.
Summary rept.
Mar 69, 18p DMRE-68-11
Revision of report dated Apr 68.

Descriptors: (*Radiation hazards, *Dentistry), X rays, X-ray tubes, Measurement, Radiation monitors, Radiological contamination, Health physics.

This report summarizes the results of the Dental Surpak Program conducted by the Bureau of Radiological Health. Included are the years 1960 to 1966. Nine tables of data are presented from the results of more than 52,000 machines surveyed by the Surpak method, and these tables report beam size and symmetry, Roentgen output, pointer cone by type and length and radiation leakage. (Author)

PB-184 481
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
SYMPOSIUM ON PAST, PRESENT, AND FUTURE STATE X-RAY PROGRAMS, ATLANTA, GEORGIA, MAY 21-22, 1968,
Robert G. Britain, and H. Richard Payne. May 69, 116p* DMRE-69-2

Descriptors: (*X rays, Radiation effects), Symposia, Public health, Medicine, Radiological dosage, Radiation hazards, Radiation tolerance, Standards, Medical personnel, Medical technicians, Education, Training, Management planning, Law.
Identifiers: *State X ray programs, X ray apparatus, X ray inspection, Surveys.

This publication contains the proceedings of a symposium held in Atlanta, Georgia on May 21-22, 1968. Cosponsors were the Bureau of Radiological Health, U.S. Public Health Service and the Georgia Department of Public Health. The objectives of the Symposium were to examine critically the goals and procedures of State X-ray protection programs and to determine what changes in organization and operation would enhance their effectiveness. Major subjects discussed are initial surveys and resurveys of X-ray installations, data management, surveyor qualifications, compliance, and regulations.

PB-184 546
National Center for Radiological Health, Rockville, Md. Medical and Occupational Radiation Program.
X-RAY EMISSION FROM SHUNT REGULATOR TUBES FOR COLOR TELEVISION RECEIVERS,
Emmet Murphy, Harold Stewart, Steven Coppola, and Norman Modine. Jun 67, 25p MORP-67-1

Descriptors: (*Television receivers, *Radiation hazards), (*Color television, Radiation hazards), X rays, Electron tubes, Voltage regulators.

The report summarizes investigations by the Public Health Service of X-ray emission from shunt regulator tubes used in color television receivers. Tables, photographs, and bibliography are presented and conclusions are discussed. (Author)

PB-184 782
Bureau of Radiological Health, Rockville, Md.
A PERSPECTIVE ON POTENTIAL RADIATION HAZARDS,
James Robert Cassady. Jun 69, 14p Seminar Paper-004

Descriptors: (*X rays, *Radiation hazards), Dose rate, Mathematical prediction, Neoplasms, Gamma rays, Aging (Physiology), Health physics.

The discussion attempts to show where opinions on potential radiation hazards are based on fact, extrapolation, or pure speculation. It is obvious that the low dose effects of radiation postulated are almost entirely based on extrapolation and speculation. This discussion also attempts to show that, assuming the extrapolations performed are valid (which they most certainly are not), the magnitude of any potential hazard of medical x-ray to general public under current radiological practice is almost unobservable. The author emphasizes that this does not mean that safety precautions need not be observed but rather that, if they are utilized and unnecessary x-radiation is eliminated, the public should have no fear of potential consequences of medical x-rays. (Author)

PB-185 979
Bureau of Radiological Health, Rockville, Md.
X-RADIATION CONTROL PROGRAMS IN THE COLOR TELEVISION INDUSTRY. SUMMARY REPORT ON VISITS TO MANUFACTURERS, MAY 1968-DECEMBER 1968,
Donald R. Smith, Henry J. L. Rechen, and D. J. Nelson, Jr. Mar 69, 29p* DEP-69-1

Descriptors: (*Color television, Radiation hazards), (*Radiation hazards, Control), X rays, Radiation measurement systems, Design, Quality control, Color television tubes, Specifications, Standards, Safety, Industrial research, Television receivers.

This report summarizes visits to color television manufacturers by Bureau of Radiological Health personnel to review the efforts being made in the design of television receivers for the reduction of X-ray emissions. The procedures used by the manufacturers for measuring X-radiation from color television receivers and components under plant conditions are discussed. Improved components and attention to radiation emission control in design and engineering indicate the television industry could manufacture essentially radiation free and safe products now. (Author)

PB-186 157
American Water Works Association Research Foundation, New York.
DISPOSAL OF WASTES FROM WATER TREATMENT PLANTS.
Water pollution control research series.
Aug 69, 295p WP-ORD-2 FWPCA-12120-08/69, W70-00162
Grant WP-1535-01-69

Descriptors: (*Water pollution, Wastes (Sanitary engineering)), (*Wastes (Sanitary engineering), Disposal), Iron, Manganese, Reports, Costs, Analysis, Industrial plants.
Identifiers: *Sludge disposal, Water treatment.

The report is an intensive study of the disposal of wastes from water treatment plants. The wastes

include filter washwater; sludge resulting from coagulation, softening, iron and manganese removal processes; diatomaceous earth filtration; and ion exchange brines. The control of pollution from these wastes is a high priority problem for the water utility industry. A series of four status reports describe in detail what is known of the research, engineering, plant operation, and regulatory aspects of the problem. A special report reviews current technology and analyzes costs of disposal methods, based on data collected from fifteen operating plants. A conference was organized to provide expert evaluation of each report and to extend the data available. Final reports were prepared by committees of conference participants to identify future needs for information in each aspect of the waste disposal problem. These reports recommend substantially expanded programs of research and demonstration. They include extensive lists of specific problems which must be investigated to develop effective and economical technology. Committee reports also recommend establishment of a central service to promote the planning of research and development, and to implement effective programs of new or improved technology. The service would collect, coordinate, and disseminate data on all aspects of water treatment plant waste disposal problems. (Author)

PB-186 158
Lawrence (A. C.) Leather Co., South Paris, Maine.
ACTIVATED SLUDGE TREATMENT OF CHROME TANNERY WASTES.
Water pollution control research series.

Sep 69, 176p WP-Ord-5 FWPCA-12120-09/69, W70-00163
Grant WPRD-133-01-68

Descriptors: (*Wastes (Industrial), Disposal), (*Water pollution, Wastes (Industrial)), (*Tanning, Wastes (Industrial)), Industries, pH, Water, Design, Pilot plants, Sanitary engineering, Calcium, Sulfides, Oxidation, Toxicity.
Identifiers: *Activated sludge process, *Sludge treatment.

A waste treatment process was developed and tested, in pilot plant scale, for the treatment of the tannery wastes in combination with municipal sewage. The process consisted of the following steps in the order employed; equalizing and mixing of the alkaline and acid wastes; primary sedimentation; carbonation followed by upflow sedimentation; addition of screened municipal sewage activated sludge treatment and secondary sedimentation of the mixed wastes; and chlorination. The sludges resulting from the treatment of the wastes and sewage were dewatered by centrifuge and were found to be suitable for burial. Design factors for the various steps of the process were developed and are presented in the attached report. Studies were made of the fundamental systems and reactions which form the bases for the processes employed in the pilot plant. (Author)

PB-187 250
Bureau of Radiological Health, Rockville, Md.
PAST AND PRESENT STATUS OF RADIATION PROTECTION: A COMPARISON,
Carl B. Braestrup. 1969, 15p Seminar Paper-005
Prepared in cooperation with Francis Delafield Hospital, New York. Presented at the X-Ray Exposure Control Labs. Seminar Program, National Center for Radiological Health, Rockville, Md., 2 Jun 67.

Descriptors: (*Radiation hazards, Protection), (*X rays, Radiation hazards), Radiation injuries, Radiological contamination, Radiography, Radiotherapy, Electron tubes, X-ray diffraction analysis, History, State-of-the-art reviews.

Significant progress has been made during the last few decades in reducing the radiation hazards (medical and nonmedical) to personnel patients, and the general public. The NCRP recommendations and their general adoption by regulating agencies have played an important role in these efforts. There is, however, still need for additional improvement in diagnostic x-ray procedures to further minimize the possibility of systemic injuries. Better beam collimation and the elimination of unnecessary and repetitive radiologic examination should be considered further. Efforts should also be made to evaluate and eliminate radiation hazards of new sources of x-rays emitted as an unwanted by-product. (Author)

PB-187 251
Bureau of Radiological Health, Rockville, Md.
APPROACHES TO THE CALCULATION OF LIMITATIONS ON NUCLEAR DETONATIONS FOR PEACEFUL PURPOSES,
G. Hoyt Whipple. 1969, 10p Seminar Paper-006
Prepared in cooperation with Michigan Univ., Ann Arbor. School of Public Health. Presented at the Seminar Program, National Center for Radiological Health, Rockville, Md., 8 Mar 68.

Descriptors: (*Nuclear explosions, Radioactive isotopes), (*Nuclear power plants, Radioactive isotopes), (*Radioactive isotopes, Radiological dosage), Tritium, Krypton, Carbon, Nuclear reactions, Fission product activity, Thermonuclear reactions, Radiological contamination, Water supplies, Atmosphere, Respiration, Food, Plants (Botany), Radiation tolerance, Symposia, Health physics.

The long-term equilibrium levels of tritium, krypton-85, and carbon-14 which are acceptable in the environment have been estimated on the following premises: (1) the three isotopes reach the environment and equilibrate throughout it in periods shorter than their half lives, (2) nuclear detonations and nuclear power constitute the dominant sources of these isotopes, (3) the radiation doses from these three isotopes add to one another and to the doses from other radioactive isotopes released to the environment, and (4) the United States, by virtue of its population, is entitled to 6% of the world's capacity to accept radioactive wastes. These premises lead to the conclusion that U.S. nuclear detonations are limited by carbon-14 to 70 megatons per year. The corresponding limit for U.S. nuclear power appears to be set by krypton-85 at 150,000 electrical megawatts, although data for carbon-14 production by nuclear power reactors are not available. (Author)

PB-187 349
Southwestern Radiological Health Lab., Las Vegas, Nev.
PROCEEDINGS FOR THE SYMPOSIUM ON PUBLIC HEALTH ASPECTS OF PEACEFUL USES OF NUCLEAR EXPLOSIVES, APRIL 7-11 1969.
1969, 874p SWRHL-82

Descriptors: (*Nuclear excavation, Meetings).
Identifiers: *Plowshare Operation.

The Southwestern Radiological Health Laboratory sponsored a Symposium on the Public Health Aspects of the Peaceful Uses of Nuclear Explosives. The purpose of the Symposium was to disseminate and document current information and data on the public health aspects of the new technical field. (Author)

PB-187 697
Baylor Univ., Houston, Tex. Coll. of Medicine.
MEDICAL RADIATION INFORMATION FOR LITIGATION,
Stewart C. Bushong, John L. Cox, Vincent P. Collins, John B. Neibel, and George B. Murphy.
Jul 69, 402p* DMRE-69-3
Contract PHS-CPE-R-69-01
Proceedings of Conference at Baylor Univ. Coll. of Medicine, Houston, Texas, Nov. 21-22, 1968. Prepared in cooperation with Houston Univ., Tex. Bates Coll. of Law.

Descriptors: (*Radiation hazards, Law), (*Radiation injuries, Law), Radiological contamination, Radiotherapy, Permissible dosage, Medical examination, Medical personnel, Records, Dosimeters.

A two day conference explored the feasibility of collecting and maintaining records of medical radiation exposure for purposes of potential litigation. The first day of this conference related to medical and scientific factors involved in radiation dosages, disease responses, monitoring instrumentation and records keeping. The second day of the conference related to litigation aspects of tort and workmen's compensation liability, causal and proof problems, factors pertinent to litigants and the application of current legal doctrines to the problem. (Author)

PB-187 724
Johns Hopkins Univ., Baltimore, Md.
SOME PHYSICAL FACTORS AFFECTING RADIOGRAPHIC IMAGE QUALITY: THEIR THEORETICAL BASIS AND MEASUREMENT,
Lloyd M. Bates, and Russell H. Morgan. 30 Jun 66, 109p PHS-Pub-999-RH-38
Contract SAph-76496
Paper Copy available from Office of Public Information and Education Environmental Control Administration, U.S. Dept. of Health, Education and Welfare, Rockville, Md. 20852.

Descriptors: (*X rays, Diagnosis), (*X-ray photography, *Photographic images), Images, Radiographic film, Density, Exposure, Experimental design, Measurement, X-ray tubes.

This report reviews the medical diagnostic process involved in determining the pathological condition of a patient made on the basis of available roentgenological information. Several years ago, a program of work on the physics of diagnostic roentgenology was established at the Johns Hopkins University. The general purpose of this program was threefold: (1) to carry out a fundamental study of the parameters of an imaging system that affect image quality; (2) to devise methods to measure these parameters; and (3) to make available to the field of radiology the results of these measurements on apparatus currently available in the United States. The manner in which the measurements were analyzed and a summary of the characteristics of radiographic films and screens currently available in the United States are included. Detailed data from the measurements are not included because of their bulk; these data will be published as a separate report in the Environmental Health Series. A set of tables and curves are presented in the appendix of this report to indicate the format in which the data will be published. (Author)

PB-187 755
Rocketdyne, Canoga Park, Calif. Chemical and Material Sciences Dept.
DILUTE SOLUTION REACTIONS OF THE NITRATE ION AS APPLIED TO WATER RECLAMATION,
Frank C. Gunderloy, Jr., Cliff Y. Fujikawa, V. H. Dayan, and S. Gird. Oct 68, 74p TWRC-1, TWRC-AWTRL-1
Contract DI-14-12-52
See also Rept. no. 2, PB-187 756.

Descriptors: (*Nitrates, *Water pollution), (*Reduction (Chemistry), Nitrates), (*Iron compounds, Oxidation-reduction reactions), Sulfates, pH, Nitration.
Identifiers: *Water treatment, *Denitration, Iron sulfate.

A new and unexpected partial denitrification of dilute nitrate ion solutions (10 to 50 ppm NO3 (-)-N) has been achieved by treatment with 8 moles of

ferrous sulfate per mole of nitrate in unbuffered alkaline reactions. The nitrogen loss, which probably represents evolution of N2 or N2O, has been as high as 50%. Total reduction to lost nitrogen plus nitrite and/or ammonia has approached 100%. The reduction takes place in the presence of partially oxidized black iron hydroxides, and requires catalytic quantities of cupric ion. Denitrification is suppressed by phosphates, as well as by several other factors, some as yet unidentified. Silver ion catalysis or a 16-fold excess of the ferrous salt permits reduction to ammonia in the presence of phosphate, but there is no accompanying denitrification. (Author)

PB-187 862
Federal Water Pollution Control Administration, Cincinnati, Ohio.
STUDIES RELATING TO MARKET PROJECTIONS FOR ADVANCED WASTE TREATMENT.
Water Pollution control research series,
Louis Koenig. Dec 66, 73p WP-20-AWTR-17
Contract PH-86-64-39
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: (*Water pollution, Control), (*Wastes (Industrial), Processing), (*Wastes (Sanitary engineering), Processing), Commerce, Distillation, Adsorption, Electrodialysis, Disposal, Water supplies, Rivers.
Identifiers: *Waste water, *Waste water treatment.

Full conventional waste water treatment will usually be applied before advanced treatment methods are required. To assess the present status of waste water treatment, the type of treatment now in use and the amount of waste water discharged were determined for the major streams in the country. About 4 percent of 100-mile river basins now have full secondary treatment. A study was made to determine the percentage of municipal waste water present in surface supplies of 155 cities of populations of 25,000 or more. The maximum was 18 percent, and median was 3.5 percent. (Author)

PB-187 866
Bituminous Coal Research, Inc., Monroeville, Pa.
SULFIDE TREATMENT OF ACID MINE DRAINAGE.
Water pollution control research series.

Nov 69, 73p* W70-01488, DAST-2
Grant FWPCA-14010-DLC

Descriptors: (*Water pollution, *Iron compounds), (*Chemical precipitation, *Sulfides), Limestone, X-ray diffraction analysis, Cost effectiveness, Coal.
Identifiers: *Water treatment, *Mine waters, Chemical removal (Water treatment), *Coal mines, Iron sulfides, Hydrogen sulfide.

During an earlier program a process for the treatment of coal mine drainage was conceived, involving the combined addition of limestone and hydrogen sulfide to effect precipitation of iron sulfides (LHS process). The black sludge formed during treatment undergoes oxidation at a rate depending on drying conditions with formation of elemental sulfur. X-ray diffraction analyses indicate the iron sulfide sludge component is an amorphous material. The unstable nature of the sulfide sludge, possibility of polysulfide formation during treatment, instability of mine waters of the type amenable to treatment, and inadequacies of available gas metering equipment are among the factors which militate against the controlled regulation of hydrogen sulfide feed necessary for successful operation of the process. These factors, and additional disadvantages revealed by an updated cost evaluation, lead to the conclusion that the LHS process is less attractive than accepted methods of mine drainage treatment. (Author)

PB-187 867
Hercules, Inc., Cumberland, Md. Allegany Ballistics Lab.
CRAZED RESIN FILTRATION OF COMBINED SEWER OVERFLOWS.
Water pollution control research series.

Oct 68, 127p W70-01487, DAST-4
Contract DI-14-12-39

Descriptors: (*Water pollution, Reduction), (*Rainfall, *Sanitary engineering), (*Sewage, Volume), (*Liquid filters, Feasibility studies), Plastics, Crazing, Water filters, Fibers (Synthetic), Manufacturing methods, Porous materials, Permeability, Fluid dynamic properties, Hydrostatic pressure, Design, Performance (Engineering), Cost effectiveness.
Identifiers: *Sewage filtration, Combined sewers, Overflows, Sewer filters, Volume reduction, Dispersions, Crazed plastics, Pressure filtration, Evaluation.

Increased sewage flows during storm conditions in most combined sewer systems dictate that most or all of the flow be diverted from treatment facilities directly to the receiving body because the flow exceeds the treatment capacity. If a large amount of the solids can be removed before discharge to the receiving water, a major part of the pollutional load would be removed. The feasibility of developing a self-cleaning, self-adjusting filtering device constructed of cylindrical structures of fibers laid down in predetermined patterns by a winding process and bonded in place by resins was investigated. The permeability of the structure is imparted by a mechanical cracking of crazing of the resin. Filtration runs showed a 62 percent reduction of suspended solids in the filtrate. However, sustained runs could not be realized. The self-cleaning aspect was not demonstrated. (Author)

PB-187 868
Hoffmann and Fiske, Boise, Idaho.
REDUCTION OF GROUND-WATER INFILTRATION INTO SEWERS BY ZONE PUMPING AT MERIDIAN, IDAHO.
Water pollution control research series.

Jun 69, 37p W70-01489, DAST-9
Grant FWPCA-11020

Descriptors: (*Water pollution, Reduction), (*Hydrology, *Sanitary engineering), (*Sewage, Volume), Pumps, Drainage, Water wells, Irrigation systems, Pipes, Rainfall, Periodic variations, Fluid flow, Cost effectiveness, Ohio.
Identifiers: *Pump drainage, Ground water infiltration, Volume reduction, Sanitary sewers, Sewage treatment plants, Hydrogeology, Observation, Evaluation.

The purpose of this study was to determine if the lowering of the high water table by pumping in a given area of the City of Meridian would eliminate infiltration of ground water to the municipal sewers. If the infiltration could be eliminated, the large volume of sewage flow that occurs during the irrigation season would be greatly reduced. The topography, geology, precipitation, as well as local irrigation programs are so irregular in character that no definite criteria could be set up to predict what would occur in other area. It is concluded that each area would have to be studied independently to decide the depth of well, pump capacity and local affecting conditions. It is also concluded that the cost of capital investment, cost of operation of these pumping projects in the entire Meridian area to lower the water table would be too expensive to accomplish the purpose of lowering the water table below the sewers so as to materially decrease the flow of infiltration water to the sewage treatment plant. (Author)

PB-188 067
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF HYDROCHLORIC ACID.
Technical rept.,
Quade R. Stahl. Sep 69, 82p*
Contract PH-22-68-25

Descriptors: (*Hydrochloric acid, *Air pollution), (*Industrial medicine, Hydrochloric acid), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Corrosion, Chlorine compounds, Halocarbon plastics.
Identifiers: *Hydrogen chloride, Phytotoxicity.

Contents: Effects on humans (Toxicity, Sensory thresholds, Synergistic effects); Effects on animals, Effects on plants (Phytotoxicity, Incidents of plant damage), Effects on materials; Environmental air standards; Natural occurrence; Production sources (By-product process, Salt-acid process, Chlorine-hydrogen synthesis); Product sources; Other sources (Coal, Fuel oil, Automobile exhaust, Burning of chloride-containing plastics; Burning of paper products; DDT production; Lemon pulp extraction); Environmental air concentrations.

PB-188 068
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF HYDROGEN SULFIDE.
Technical rept.,
Sydney Miner. Sep 69, 107p*
Contract PH-22-68-025

Descriptors: (*Sulfides, *Air pollution), (*Industrial medicine, Sulfides), Hydrogen compounds, Reviews, Toxicity, Odors, Humans, Animals, Plants (Botany), Paints, Metals, Corrosion, Petroleum industry, Chemical industry, Mining engineering, Iron industry, Incinerators, Tanning, Water pollution, Sewage, Chemical analysis, Volumetric analysis, Methylene blue.
Identifiers: *Hydrogen sulfide, Coke, Kraft paper, Paper industry, Scrubbers.

Contents: Hydrogen sulfide's effects on humans: (Odor threshold, Pollution occurrences); Effects on animals; Effects on plants; Effects on materials: (Effects on paint, Effects on metals); Environmental air standards; Natural occurrence; Production sources (Petroleum industry, Petrochemical plant complexes, Kraft mills, Coke ovens, Mining, Iron-steel industry and foundries, Chemical industry, Animal processing plants and tanneries); Product sources; Other sources (Combustion processes, Polluted water, Well water, Sewage plants and sewers); Environmental air concentration; Abatement (Kraft paper mills, Petroleum industry and petrochemical plants, Coke-oven plants and chemical plants, Coal piles, Tanneries, Sewers and sewage plants), Economics, Methods of analysis.

PB-188 069
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF ETHYLENE.
Technical rept.,
Quade R. Stahl. Sep 69, 63p*
Contract PH-22-68-25

Descriptors: (*Ethylenes, *Air pollution), (*Plants (Botany), Ethylenes), Reviews, Toxicity, Humans, Animals, Photochemistry, Metabolism, Combustion products, Exhaust gases, Incinerators, Economics, Chemical analysis, Gas chromatography.
Identifiers: *Plant growth, Agricultural wastes, Automobile exhaust, Spectroscopic analysis.

Contents: Ethylene's effects on humans; Effects on animals; Effects on plants (Phytotoxicity, Sensitivity of plants, Incidents of plant damage); Effects on materials; Environmental air standards; Natural occurrence; Production sources (Pyrolytic processes); Product sources; Other sources (Au-

tomobile and diesel emissions, Incinerator effluents, Burning of agricultural wastes); Environmental air concentrations; Abatement; Economics; Methods of analysis.

PB-188 670
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF NICKEL AND ITS COMPOUNDS.
Technical rept.,
Ralph J. Sullivan. Sep 69, 76p*
Contract PH-22-68-25

Descriptors: (*Nickel, *Air pollution), (*Nickel compounds, Air pollution), (*Industrial medicine, Nickel), Reviews, Toxicity, Humans, Animals, Plants (Botany), Respiratory diseases, Cancer, Mining engineering, Refining (Metallurgy), Asbestos, Coal, Fuel oil, Incinerators, Economics, Metal carbonyls, Chemical analysis.
Identifiers: *Dermatitis, *Nickel carbonyls, Spectrochemical analysis, Spectroscopic analysis.

Contents: Nickel's and nickel compound's effects on humans (Dermatitis, Respiratory disorders, Cancer of the respiratory tract); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Mines, Metallurgical industry); Product sources; Other sources (Asbestos, Coal, Fuel oil, Incineration); Environmental air concentration; Abatement; Economics; Methods of analysis (Sampling methods, Quantitative methods (Nickel particulates, Nickel carbonyl)).

PB-188 671
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF ARSENIC AND ITS COMPOUNDS.
Technical rept.,
Ralph J. Sullivan. Sep 69, 72p*
Contract PH-22-68-25

Descriptors: (*Arsenic, *Air pollution), (*Arsenic compounds, Air pollution), (*Arsines, Air pollution), (*Industrial medicine, Arsenic), Reviews, Toxicity, Humans, Animals, Plants (Botany), Pesticides, Manufacturing methods, Cotton, Chemical analysis, Economics, Coal, Chemical analysis.
Identifiers: Arsenic oxides, Arsenic organic compounds, Cotton gins, Smelting.

Contents: Arsenic's and arsenic compounds' effect on humans (Carcinogenesis, Community episodes); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources (Pesticides, Cotton gins); Environmental air concentrations; Abatement; Economics; Methods of analysis.

PB-188 672
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF ZINC AND ITS COMPOUNDS.
Technical rept.,
Yanis C. Athanassiadis. Sep 69, 90p*
Contract PH-22-68-25

Descriptors: (*Zinc, *Air pollution), (*Zinc compounds, Air pollution), (*Industrial medicine, Zinc), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Zinc coatings, Refining (Metallurgy), Bronze, Brass, Furnaces, Incinerators, Chemical analysis.
Identifiers: Zinc oxides.

Contents: Zinc's and zinc compounds' effects on humans (Inhalation, Ingestion, Skin contact); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Mining, Smelting and refining); Product sources (Zinc galvanizing, Brass production, Incineration); Environmental air concentrations; Abatement (Zinc smelting operations, Galvanizing operations, Zinc-alloy sweating operations, Secondary brass melting operations, Open-hearth and electric-arc furnaces, Steel operations); Economics; Methods of analysis.

PB-188 673
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF PHOSPHORUS AND ITS COMPOUNDS.
Technical rept.,
Yanis C. Athanassiadis. Sep 69, 86p*
Contract PH-22-68-25

Descriptors: (*Phosphorus, *Air pollution), (*Phosphorus compounds, Air pollution), (*Organic phosphorus compounds, Air pollution), (*Fertilizers, Air pollution), (*Industrial medicine, Phosphorus), Reviews, Toxicity, Humans, Animals, Plants (Botany), Phosphoric acids, Phosphonic acids, Phosphates, Fuel additives, Gasoline, Fluorides, Manufacturing methods, Chemical analysis, Phosphines.
Identifiers: Spectroscopic analysis.

Contents: Phosphorus' and phosphorus compounds' effects on humans; Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources (Phosphoric acids, Phosphate fertilizers, Phosphine); Other sources (Oil-fired boilers, Iron and steel industry, Transportation sources); Environmental air concentrations; Abatement; Economics; Methods of analysis; Sampling methods (Free phosphorus in air, Phosphoric acid (Plants, stack gasses), Phosphine); Quantitative methods (Phosphorus and phosphoric acid, Phosphine, Organophosphorus pesticides).

PB-188 674
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF MERCURY AND ITS COMPOUNDS.
Technical rept.,
Quade R. Stahl. Sep 69, 108p*
Contract PH-22-68-25

Descriptors: (*Mercury, *Air pollution), (*Mercury compounds, Air pollution), (*Industrial medicine, Mercury), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Chemical analysis, Economics, Metalorganic compounds, Monitors.
Identifiers: *Mercury organic compounds, Spectrochemical analysis.

Contents: Mercury's and mercury compounds' effects on humans (Absorption, Distribution, Excretion, Inhibition of enzymes, Toxicity); Effects on animals; Effects on plants; Effects on materials; Environmental air standards (Mercury and its inorganic compounds, Mercury organic compounds); Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Methods of analysis.

PB-188 675
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF CHROMIUM AND ITS COMPOUNDS.
Technical rept.,
Ralph J. Sullivan. Sep 69, 86p*
Contract PH-22-68-25

Descriptors: (*Chromium, *Air pollution), (*Chromium compounds, Air pollution), (*Industrial medicine, Chromium), (*Chromates, Air pollution), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Refractory materials, Chemical industry, Iron industry, Chromizing, Asbestos, Coal, Cements, Welding rods, Chemical analysis.
Identifiers: Spectrochemical analysis.

Contents: Chromium's and chromium compounds' effects on humans (Chromium metal, Trivalent chromium, Chromates, Carcinogenesis, Nutrition); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Metallurgical industry, Refractory materials); Product sources (Chemical industry, Chrome plating); Other sources (Asbestos, Coal, Cement, Welding rods); Environmental air concentrations; Abatement; Economics; Methods of analysis.

PB-188 676
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF AEROALLERGENS (POLLENS).
Technical rept.,
Harold Finkelstein. Sep 69, 118p*
Contract PH-22-68-25

Descriptors: (*Pollen, *Air pollution), Effectiveness, Humans, Allergy, Plants (Botany), Materials, Sources, Economics, Control, Analysis.

Aeroallergens (pollens) are airborne materials which elicit a hypersensitivity response in susceptible individuals. The two major responses exhibited are allergic rhinitis and bronchial asthma. The pollens of wind-pollinated plants are the most important of the aeroallergens, and ragweed pollen is commonly found in this group. Ragweed pollen is the cause of more than 90 percent of pollinosis in this country. Other aeroallergens include molds, house dust, danders, and a miscellaneous group of insecticides, cosmetics, paints, and vegetable fibers. Most of the aeroallergen investigations have been concerned with ragweed. Pollen counts are taken daily in many local areas throughout the country. These counts are used as guidelines for anticipating and understanding the incidence of pollinosis in a given area rather than as standards. Local programs of ragweed eradication generally have met with little success in controlling pollen concentrations. The pollen can be windborne for many miles, and therefore pollen entering a city from the outside usually is sufficient to cause pollinosis in the susceptible population. The gravity slide method has been accepted as the standard procedure for pollen sampling by the Pollen Survey Committee of the American Academy of Allergy. (Author)

PB-188 677
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF SELENIUM AND ITS COMPOUNDS.
Technical rept.,
Quade R. Stahl. Sep 69, 88p*
Contract PH-22-68-25

Descriptors: (*Selenium, *Air pollution), (*Selenium compounds, Air pollution), (*Industrial medicine, Selenium), Reviews, Toxicity, Humans, Animals, Plants (Botany), Selenides, Nutrition, Grasses, Cereals, Cancer, Manufacturing methods, Monitors, Chemical analysis.
Identifiers: Selenium oxides, Senenates, Hydrogen selenide, Selenium organic compounds.

Contents: Selenium's and selenium compounds' effects on humans (Chronic effects, Acute poisoning, Retention and elimination, Detoxification, Selenium in nutrition, Elemental selenium, Selenium dioxide, Selenites, Selenates, Hydrogen selenide, Selenium oxychloride, Organoselenium compounds); Effects on animals; Effects on plants (Selenium indicator plants, Secondary selenium absorbers, Grains, Vegetables, Grasses, Other vegetation); Effects on materials; Environmental air standards; Natural occurrence; Production

sources; Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.

PB-188 078
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF BERYLLIUM AND ITS COMPOUNDS.
Technical rept.,
Norman L. Durocher. Sep 69, 92p*
Contract PH-22-68-25

Descriptors: (*Beryllium, *Air pollution), (*Beryllium compounds, Air pollution), (*Industrial medicine, Beryllium), Reviews, Toxicity, Humans, Animals, Plants (Botany), Mining engineering, Refining (Metallurgy), Beryllium oxides, Beryllium alloys, Solid rocket propellants, Coal, Economics, Chemical analysis, Quantitative analysis, Respiratory diseases, Cancer.
Identifiers: *Berylliosis, Fluorescent lamps, Spectroscopic analysis.

Contents: Beryllium's and beryllium compounds' effects on humans (Acute beryllium disease, Chronic beryllium disease, Carcinogenicity); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources (Beryllium-copper alloys, Fluorescent tubes, Rocket fuels, Coals); Environmental air concentration; Abatement; Economics; Sampling methods; Quantitative methods (Morin fluorescent method, Colorimetric method, Spectrographic method).

PB-188 079
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF MANGANESE AND ITS COMPOUNDS.
Technical rept.,
Ralph J. Sullivan. Sep 69, 63p*
Contract PH-22-68-25

Descriptors: (*Manganese, *Air pollution), (*Manganese compounds, Air pollution), (*Industrial medicine, Vanadium), Reviews, Toxicity, Oxides, Humans, Steel industry, Batteries + components, Gasoline, Fuel additives, Animals, Manufacturing methods, Chemical analysis, Quantitative analysis.
Identifiers: Manganese oxides, Manganese steels.

Contents: Effects on humans (Chronic manganese poisoning; Manganic pneumonia); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrences; Production sources (Iron and steel industry, Coal, Fuel oil); Product sources (Dry-cell batteries, Chemicals); Environmental air concentrations; Economics; Methods of analysis (Sampling methods, Quantitative methods).

PB-188 080
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF ASBESTOS.
Technical rept.,
Ralph J. Sullivan, and Yanis C. Athanassiadis. Sep 69, 105p*
Contract PH-22-68-25

Descriptors: (*Asbestos, *Air pollution), (*Industrial medicine, Asbestos), Reviews, Toxicity, Humans, Animals, Cancer, Respiratory diseases, Plants (Botany), Manufacturing methods.
Identifiers: *Asbestosis, Mesothelioma.

Contents: Effects on humans (Asbestosis, Pleural calcification and plaques, Cancer, 'Asbestos bodies'); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.

PB-188 081
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF ALDEHYDES.
Technical rept.,
Quade R. Stahl. Sep 69, 149p*
Contract PH-22-68-25

Descriptors: (*Aldehydes, *Air pollution), (*Formaldehyde, Air pollution), (*Acroleins, Air pollution), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Irritating agents, Photochemistry, Exhaust gases, Diesel engines, Aircraft engines, Combustion products, Coal, Fuel oil, Refineries, Chemical analysis, Quantitative analysis.
Identifiers: *Photochemical reactions, Automobile exhaust, Natural gas, Spectroscopic analysis.

Contents: Aledhydes' effects on humans (Physiological effects, Annoyance effects); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Formaldehyde manufacture, Acrolein manufacture); Product sources; Other sources (Atmospheric photochemical reactions, Mobile combustion sources, Stationary combustion sources); Environmental air concentrations; Abatement; Economics; Methods of analysis.

PB-188 082
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF AMMONIA.
Technical rept.,
Sydney Miner. Sep 69, 51p*

Descriptors: (*Ammonia, *Air pollution), (*Industrial medicine, Ammonia), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Refineries, Economics, Combustion products, Economics, Incinerators, Monitors, Chemical analysis.
Identifiers: Scrubbers, Spectroscopic analysis.

Contents: Ammonia's effects on humans; Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Haber-bosch process, Coke plants, Oil refineries, Metallurgical and ceramic plants, Combustion processes); Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.

PB-188 083
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF BARIUM AND ITS COMPOUNDS.
Technical rept.,
Sydney Miner. Sep 69, 69p*
Contract PH-22-68-25

Descriptors: (*Barium, *Air pollution), (*Barium compounds, Air pollution), (*Industrial medicine, Barium), (*Fuel additives, Barium compounds), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Fuel oil.
Identifiers: Barite.

Contents: Effects on humans; Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Mining and milling of barite, Barium metal); Product sources (Ground barite, Principal barium compounds, Diesel fuel additives); Abatement; Economics; Methods of analysis.

PB-188 084
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF BIOLOGICAL AEROSOLS (MICROORGANISMS).
Technical rept.,
Harold Finkelstein. Sep 69, 109p*
Contract PH-22-68-25

Descriptors: (*Microorganisms, *Air pollution), Bacterial aerosols, Diseases, Effectiveness, Humans, Animals, Plants (Botany), Respiratory diseases, Influenza virus, Materials, Mycobacterium tuberculosis, Cholera, Newcastle disease virus, Control, Sampling, Analysis.

Biological aerosols--suspensions of microorganisms in the air--can cause diseases in humans, animals, and plants and degradation of inanimate materials. The present knowledge pertaining to the relationships between dose-effect, viability, survival of microorganisms in aerosols, and other factors is insufficient for establishing standards for either indoor or outdoor environmental air concentrations. The source of most human and animal airborne pathogens is the host organism that recently harbored the pathogens. However, since biological aerosols generally are detrimentally affected by exposure to the atmosphere, they are usually found in spaces close to the host. The abatement and control of biological aerosols have been successful only in environmentally-controlled indoor spaces. There has been no adequate way to estimate either the cost of the effects of biological aerosols, or the cost of abatement and control. (Author)

PB-188 085
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF BORON AND ITS COMPOUNDS.
Technical rept.,
Norman L. Durocher. Sep 69, 55p*
Contract PH-22-68-25

Descriptors: (*Boron, *Air pollution), (*Boranes, Air pollution), (*Borates, Air pollution), (*Borides, Air pollution), (*Industrial medicine, *Boron compounds), Reviews, Toxicity, Animals, Humans, Plants (Botany), Refining (Metallurgy), Diboranes, Pentaboranes, Decaboranes, Refractory materials, Chemical analysis, Monitors, Fuel additives, Coal, Exhaust gases, Boric acids.
Identifiers: *Borax, *Boron oxides, Automobile exhaust, Tetraborane (10).

Contents: Boron's and boron compounds' effects on humans (Boranes, Boric acid, Sodium borates, Boron oxide, Other boron compounds); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrences; Production sources; Product sources (Boron oxide, Boric acid, Borates, Boric acid esters, Refractory boron compounds, Boron halides, Diborane, Tetraborane, Pentaborane, Decaborane); Environmental air concentrations; Abatement; Methods of analysis.

PB-188 086
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF CADMIUM AND ITS COMPOUNDS.
Technical rept.,
Yanis C. Athanassiadis. Sep 69, 92p*
Contract PH-22-68-25

Descriptors: (*Cadmium, *Air pollution), (*Cadmium compounds, Air pollution), (*Industrial medicine, Cadmium), Reviews, Toxicity, Humans, Animals, Respiratory diseases, Cardiovascular system, Cancer, Plants (Botany), Manufacturing methods, Chemical analysis.
Identifiers: Emphysema.

Contents: Effects on humans (Respiratory systems, Cardiovascular system, Carcinogenesis); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.

PB-188 087
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.

AIR POLLUTION ASPECTS OF CHLORINE GAS.
Technical rept.,
Quade R. Stahl. Sep 69, 90p*
Contract PH-22-68-25

Descriptors: (*Chlorine, *Air pollution), (*Industrial medicine, Chlorine), Reviews, Toxicity, Humans, Animals, Plants (Botany), Manufacturing methods, Electrolysis, Electrolytic cells, Organic solvents, Chemical analysis, Quantitative analysis.
Identifiers: Scrubbers, Air pollution control equipment, Spectroscopic analysis.

Contents: Chlorine gas' effects on humans (Acute effects, Chronic effects, Sensory thresholds, Synergistic effects, Chlorine gas exposure to communities through accidents); Effects on animals; Effects on plants (Phytotoxicity, Sensitivity of plants, Effect of moisture, Effect of light, Effect of water stress, Plant accumulations, Episodes of plant damage); Effects on materials; Environmental air standards; Natural occurrence; Production sources (Electrolytic diaphragm cells, Electrolytic mercury cells, Fusion electrolysis of chloride salts); Product sources (Chlorinated organic chemicals, Other organic chemicals, Inorganic chemicals); Environmental air concentrations; Abatement (Water scrubbers, Alkali scrubbers, Carbon tetrachloride scrubbers); Economics; Methods of analysis.

PB-188 088
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF IRON AND ITS COMPOUNDS.
Technical rept.,
Ralph J. Sullivan. Sep 69, 106p*
Contract PH-22-68-25

Descriptors: (*Iron, *Air pollution), (*Iron compounds, Air pollution), (*Iron industry, Air pollution), (*Industrial medicine, Air pollution), Reviews, Toxicity, Humans, Animals, Plants (Botany), Blast furnaces, Incinerators, Coal, Fuel oil, Fuel additives, Exhaust gases, Monitors, Chemical analysis, Cancer.
Identifiers: Automobile exhaust, Spectroscopic analysis.

Contents: Iron's and iron compounds' effects on humans: (Carcinogenesis, Synergism, Nutrition, Iron pentacarbonyl); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Iron and steel industry, Coal, Fuel oil); Product sources (Incineration, Welding rods, Antiknock compounds); Environmental air concentrations; Abatement (Iron and steel industry); Economics; Methods of analysis.

PB-188 089
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF ODOROUS COMPOUNDS.
Technical rept.,
Ralph J. Sullivan. Sep 69, 258p*
Contract PH-22-68-25

Descriptors: (*Odors, *Air pollution), (*Exhaust gases, Odors), (*Smell, Odors), Reviews, Chemical industry, Paper industry, Coal, Iron industry, Food, Meat, Diesel engines, Petroleum industry, Aircraft engines, Sewage, Sensory mechanisms, Toxicity, Humans, Animals, Plants (Botany), Gas detectors, Economics, Chemical analysis, Gas chromatography.
Identifiers: *Odor control, *Odor detection, Coke, Food processing, Automobile exhaust, Kraft paper.

Contents: Odorous compounds' effects on humans (Characteristics of odors, Physiological and psychological, Theories of olfaction); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Petroleum industry, Petrochemical plant complexes, Chemical industry, Pulp and paper mills, Coke ovens and coal, Iron-steel industry and foundries, Food processing, Meat industry); Other sources (Diesel engine odors, Aircraft odors, Sewage); Environmental air concentrations; Abatement (Petroleum industry, Chemical industry, Pulp and paper mills, Coke ovens and coal, Diesel engine odors, Meat industry, Sewage); Economics; Methods of analysis.

PB-188 090
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF ORGANIC CARCINOGENS.
Technical rept.,
Douglas A. Olsen, and James L. Haynes. Sep 69, 131p*
Contract PH-22-68-25

Descriptors: (*Cancer, *Air pollution), (*Industrial medicine, Cancer), (*Polycyclic compounds, Air pollution), Reviews, Anthracenes, Phenanthrenes, N-heterocyclic compounds, O-heterocyclic compounds, Ketones, Peroxides, Toxicity, Humans, Animals, Plants (Botany), Chemical analysis, Gas chromatography, Thin layer chromatography, Exhaust gases, Combustion products.
Identifiers: *Carcinogens, *Aromatic polycyclic hydrocarbons, *Benzopyrenes, Automobile exhaust, Benzanthracenes, Benzofluoranthenes, Chrysenes, Dibenzochrysenes, Dibenzacridines, Benzoanthracenones.

Contents: Types of organic carcinogens (Polynuclear aromatic hydrocarbons, Polynuclear heterocyclics and oxygenated compounds, Alkylating agents); Organic carcinogens as cocarcinogens or anticarcinogens; Effects on humans (Particulate matter, Particle size, Irritants, Studies with biological material); Effects on animals; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Sampling methods; Extraction methods; Separation (Column chromatography, Thin-layer chromatography, Gas chromatography, Other techniques); Spectroscopic analysis.

PB-188 091
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF PESTICIDES.
Technical rept.,
Harold Finkelstein. Sep 69, 186p*
Contract PH-22-68-25

Descriptors: (*Air pollution, *Pesticides), (*Herbicides, Air pollution), (*Fungicides, Air pollution), (*Insecticides, Air pollution), (*DDT, Air pollution), Toxicity, Phosphates, Organic phosphorus compounds, Plants (Botany), Humans, Economics, Manufacturing methods, Quantitative analysis, Lethal dosage, Chlordane, Gas chromatography, Parathion, Inorganic compounds, Arsenic compounds, Carbamic acids, Naphthalenes, Triazines, Urea, Phenols, Sulfides.
Identifiers: *Chlorine organic compounds, Benzene/hexachloro, Aldrin, Dieldrin, Endrin, Hetachlor Strobane, Toxaphene, Malathion, 2-4 D herbicide, 3-4-5 T herbicide, Propionic acid/2- (2-4-5-trichlorophenoxy), Nitro compounds, Dimethanonaphthalenes, Phosphonates.

Contents: Effects on humans; Insecticide effects and toxicities (DDT group, Aldrin-toxaphene group, Benzene hexachloride group, Other chlorinated hydrocarbons, Organophosphates); Herbicide effects and toxicities; Fungicide effects and toxicities; Specific effects and case histories; Effects on animals; Effects on plants; Effect on materials; Environmental air standards; Natural occurrence; Production sources; Product sources; Environmental air concentrations; Abatement; Economics; Methods of analysis.

PB-188 092
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF RADIOACTIVE SUBSTANCES.
Technical rept.,
Sydney Miner. Sep 69, 159p*
Contract PH-22-68-25

Descriptors: (*Radioactive isotopes, *Air pollution), (*Radioactive waste, Air pollution), (*Nuclear power plants, Air pollution), Reviews, Radioactive fallout, Toxicity, Humans, Animals, Plants (Botany), Cancer, Combustion products, Dosimeters, Dose rate, Radiological dosage, Cosmic rays, Reactor fuels, Uranium, Refining (Metallurgy), Economics, Chemisorption, Filters (Fluid), Iodine, Tritium, Helium group gases, Reactor fuel processing, Monitors, Gas analysis.
Identifiers: Cataracts.

Contents: Radioactive substances' Effects on humans (Types of exposure, Biological effects (Somatic effects, Leukemia, Other cancers, Cataracts, Effect on life span), Genetic effects, Acute exposure), Effects on animals; Effects on plants; Effects on materials; Environmental air standards (Maximum permissible dose (MPD), Maximum permissible concentrations (MPC)); Natural occurrence (Radioactive dusts, Cosmic rays, Combustion emissions, Natural radioactivity); Production Sources (Production of nuclear fuel, Nuclear reactors, Fuel reporcessing, Nuclear power industry projections, Nuclear Tests); Product sources (Aerospace applications); Control of radioactive pollution (Limitation of the emission of radioactive pollutants, Containment, Dispersal); Location of facility site; Air cleaning methods (Radioactive particulates, Wet collection); Radioactive gases and vapors (Chemisorption and adsorption, Absorption, Delay in storage); Economics, Sampling methods (Filters, Impactors, Impingers, Settling Trays); Quantitative methods (Analysis of collected particulate samples for activity Radioactive particle size analysis, Gases (Iodine, Tritium, Noble gases, Other radioactive gases), Air quality monitoring).

PB-188 093
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
AIR POLLUTION ASPECTS OF VANADIUM AND ITS COMPOUNDS.
Technical rept.,
Yanis C. Athanassiadis. Sep 69, 105p*
Contract PH-22-68-25

Descriptors: (*Vanadium, *Air pollution), (*Vanadium compounds, Air pollution), (*Industrial medicine, Vanadium), Reviews, Toxicity, Humans, Animals, Vanadates, Ores (Metal sources), Plants (Botany), Coal, Processing, Oils, Cholesterol, Economics.
Identifiers: Vanadium oxides, Vanadium pentoxide, Vanadium chlorides, Vanadium carbides, Sodium vanadates.

Contents: Effects on humans; Effects on animals; Vanadium pentoxide; Vanadium trioxide; Vanadium chloride; Vanadium metal; Vanadium carbide; Ferrovanadium; Sodium metavanadate; Effects on plants; Effects on materials; Environmental air standards; Natural occurrence; Production sources (Recovery of vanadium-oxide from vanadium bearing ores, Production of vanadium metal, Vanadium-bearing alloys, Vanadium chemicals); Environmental air concentrations; Abatement; Economics; Methods of analysis (Colorimetric methods, Atomic absorption spectroscopy, Polarography, Emission spectrography).

PB-188 094
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.

STOCHASTIC MODELS FOR BIOCHEMICAL OXYGEN DEMAND AND DISSOLVED OXYGEN IN ESTUARIES,
Stephen W. Custer, and Richard G. Krutchkoff. Feb 69, 249p* Bull-22 W70-01774, FWPCA-16090-02/69

Descriptors: (*Water pollution, Mathematical models), (*Estuaries, Oxygen), Potomac River, Stochastic processes, Statistical distributions, Differential equations, Numerical analysis, Computer programs, Diffusion.
Identifiers: Biochemical oxygen demand, Dissolved oxygen, Dissolved gases.

Two distinct stochastic models, the Non-Dispersion Model and the Diffusion Model were developed for determining the biochemical oxygen demand (BOD) and dissolved oxygen (DO) probability distribution in an estuary. The mean BOD and DO concentrations were functions of time and space, hence the probability distributions were also temporally and spatially dependent. A computer program was employed to summarize the results in a concise form so that it could be used in the overall decision process. Information for a given point in space was obtained five miles downstream from the source. The mean BOD and DO levels were obtained for each increment of the tidal cycle. The frequency of the concentration above each critical value was obtained. A comparison of the numerical results revealed that the traumatic peaks observed for the non-dispersion model were obliterated in the diffusion model. In the light of the numerical results it concluded that the non-diffusion model was inadequate for describing the estuary situation. The diffusion model was verified on water quality survey data for the Potomac estuary. (Author)

PB-188 095
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.
GENERALIZED INITIAL CONDITIONS FOR THE STOCHASTIC MODEL FOR POLLUTION AND DISSOLVED OXYGEN IN STREAMS.
Richard H. Moushegian, and Richard G. Krutchkoff. Aug 69, 93p* Bull-28 W70-01775, FWPCA-16090-08/69

Descriptors: (*Water pollution, Mathematical models), (*Rivers, Oxygen), Initial value problems, Probability density functions, Statistical distributions, Stochastic processes, Mathematical prediction, Computer programs.
Identifiers: Biochemical oxygen demand, Dissolved oxygen, Dissolved gases.

A stochastic model was developed and used to predict the biochemical oxygen demand (BOD) and dissloved oxygen (DO) concentrations at several points downstream of a waste discharge. The model used provided a joint density function for both pollution and and dissolved oxygen with given initial conditions. The initial conditions were generalized to permit the output for one stream segment to be the initial conditions for the succeeding stream segment. Interest was focused on the measurement of the marginal distribution of BOD and DO along a stream stretch whose parameters may change at known locations. A computer program assisted in the calculations to obtain marginal distributions. The program allowed for changes in parameter values between one stream segment and the next and could predict distributions for any intermediate locations along the river. The application of this study lay in the analysis of an entire stream stretch to determine if it was healthy for the users within certain preset probabilistic standards. (Author)

PB-188 286
Federal Water Pollution Control Administration, Washington, D.C.
BIOLOGICAL EFFECTS OF OIL POLLUTION--BIBLIOGRAPHY. A COLLECTION OF REFERENCES CONCERNING THE EFFECTS OF OIL ON BIOLOGICAL SYSTEMS.
Water pollution control research series,
Donna R. Radcliffe, and Thomas A. Murphy. Oct 69, 52p* DAST-19 W70-02038

Descriptors: (*Water pollution, *Oils), Ecology, Marine biology, Aquatic animals, Plants (Botany), Birds, Biology, Neoplasms, Animals, Bibliographies.
Identifiers: *Oil pollution.

References on the biological effects of oil are listed according to the following categories: Publications on the General Aspects of Oil Pollution, Reports of Oil Spill Incidents, General Biological Effects of Oil and of Specific Oil Spill Incidents, Effects of Oil on Birds, Effects of Oil on Fish, Effects of Oil on Shellfish, Effects of Oil on Freshwater Invertebrates, Effects of Oil on Plants, Effects of Oil on Dissolved Oxygen, Carcinogenic Effects of Oil, and Miscellaneous Biological Reports on Oil. (Author)

PB-188 494
Northeastern Univ., Boston, Mass. Dept. of Civil Engineering.
USE OF MATHEMATICAL MODELS IN WATER QUALITY CONTROL STUDIES,
Alvin S. Goodman, and Richard J. Tucker. Jul 69, 140p* FWPCA-16090-07/69
Grant WP-01090

Descriptors: (*Sewage, Water pollution), (*Rivers, Water pollution), (*Water pollution, *Hydraulic models), Mathematical models, Sanitary engineering, Statistical analysis, Programming (Computers), Quality control, Costs, Purification, Fluid flow, Sampling, Accuracy.
Identifiers: *Stream pollution, *Water quality, Sewage treatment, Stream flow, Computerized simulation, Waste water, Water treatment, Biochemical oxygen demand.

Mathematical models were utilized to study water pollution control programs in a river basin. Sensitivity analyses, with a steady state model, showed substantial variation of cost for sewage treatment, depending upon stream purification parameter selections. When actual parameters are less favorable than design values, quality standards may not be met; these effects are more serious with lower levels of treatment. An unsteady state model was developed to trace a time profile at any specified station in terms of flow and quality while up-stream discharge, water temperature, and solar radiation vary. The techniques assume that, for short reaches and/or times, steady state conditions apply without undue loss of accuracy. A new empirical procedure was developed to route unsteady stream flow. The time varying model was used to investigate the effectiveness of an assumed configuration of treatment plants when the stream's assimilative capacity varies with distance and time. Susceptibility to poorer conditions increases with higher BOD releases. Lower treatment levels also result in a greater range of river conditions than high levels. Sensitivity analyses of stream parameters were also made with the time varying model. (Author)

PB-188 495
California Univ., Berkeley. Sanitary Engineering Research Lab.
ECONOMIC EVALUATION OF WATER QUALITY. A MULTICOMPONENT MODEL OF OPTIMAL QUALITY CONTROL IN ESTUARINE WATERS.
Rept. no. 4 (Annual),
Shishir K. Mukherjee. Jan 69, 109p SERL-69-2
FWPCA-16090-DLU-02/69
Grant WP-597-05

Descriptors: (*Estuaries, Hydrology), (*Water pollution, Mathematical models), Quality control, Sanitary engineering, Economics, Diffusion, Pipes, Wastes (Sanitary engineering), Linear programming, Theorems, Transport properties, Water supplies, Programming (Computers), Degradation, Oxygen.
Identifiers: Water quality models.

The overall objectives of the study, were to utilize the techniques of operations research to determine the economic effects of changing the water quality requirements of an estuarine water basin. The specific objectives were: To study the transportation, dispersion, and degradation of waste constituents in an estuarine basin. To develop dispersion models for optimal allocation of water quality in an estuary to achieve various related objectives. To develop discrete versions of the disper ion models as linear programs. To develop an integrated multicomponent model of dispersion and waste treatment which will simultaneously provide an optimal plan of waste treatment. To study various modifications of the model and the economic effects of various alternative quality-improvement projects. (Author)

PB-188 505
Underwater Storage, Inc., Washington, D.C.
COLLECTION, UNDERWATER STORAGE AND DISPOSAL OF PLEASURECRAFT WASTE. FEASIBILITY OF CONNECTING SEWAGE HOLDING TANKS ON BOARD RECREATIONAL WATERCRAFT TO A DOCKSIDE COLLECTION SYSTEM AND STORAGE IN AN UNDERWATER TANK.

Sep 69, 85p* FWPCA-DAST-10 W70-02283, FWPCA-15020-DHE-09/69
Contract DI-14-12-493
Prepared in cooperation with Silver, Schwartz, Ltd., Washington, D.C.

Descriptors: (*Wastes (Sanitary engineering), Disposal), (*Boats, Wastes (Sanitary engineering)), Storage tanks, Underwater, Collecting methods, Water pollution, Design, Pumps, Sewage, Costs.

A pilot plant was designed, constructed and operated to show the feasibility of providing a facility for the collection, storage and disposal of waste from recreational watercraft. An on-board holding tank was installed in each of ten boats for total impoundment of all effluent and for the connection to a dockside sewage collection system through a quick-connect coupling. Each boat was provided with a pump, tank and macerator. At dockside, each boat holding tank was pumped directly into a piped collection system. The project demonstrated that on-board storage of watercraft waste and subsequent discharge to an underwater storage tank was effective and economical. This project showed that the discharge of sewage from boats into rivers, lakes, waterways and estuaries could be eliminated. (Author)

PB-188 506
Snokist Growers, Yakima, Wash.
AEROBIC TREATMENT OF FRUIT PROCESSING WASTES.
Water pollution control research series,
Larry A. Esvelt. Oct 69, 145p* FWPCA-DAST-8 W70-02284, FWPCA-12060-FAD-10/69
Prepared in cooperation with Gray and Osborne Consulting Engineers.

Descriptors: (*Canning, Wastes (Industrial)), (*Wastes (Sanitary engineering), Disposal), Fruits, Processing, Industrial plants, Water pollution, Bacteria, Costs, Design, Disposal.

The treatment systems were studied over the two operating seasons, and operated as an aerated lagoon, as an activated sludge treatment system and as activated sludge system but including sludge reaeration. Data was collected on biological substrate assimilation, sludge growth, oxygen uptake and sludge settleability. Constants were obtained from this data. Success of the treatment system is reported and the costs of treatment computed. It is recommended that aerated lagoon treatment be used where 70 percent removal of BOD is desired and suspended solids are permissible in the effluent. Activated sludge treatment is recommended for greater than 90 percent BOD removal and where effluent suspended solids must be minimized. (Author)

PB-188 507
Federal Water Pollution Control Administration, Washington, D.C.
PROJECTS OF THE INDUSTRIAL POLLUTION CONTROL BRANCH.
Water pollution control research series,
William J. Lacy. Aug 69, 170p FWPCA-12000-08/69, W70-02285

Descriptors: (*Wastes (Industrial), Water pollution), (*Water pollution, Control), Statistical analysis, Tables, Contracts, Scientific research.
Identifiers: Waste water, Waste treatment, *Industrial pollution control.

The objective of the industrial pollution control R and D program is to develop and demonstrate the required technology to achieve pollution control by lease cost methods for all significant industrial sources of pollution. The report includes descriptions of 141 projects. (Author)

PB-188 619
Stanford Research Inst., Menlo Park, Calif.
SURVEY OF THE USE OF RADIONUCLIDES IN MEDICINE,
R. M. Rodden, B. E. Suta, and L. W. Weisbecker.
Aug 69, 147p*
Contract PH-86-67-15
Supersedes PB-182 888.

Descriptors: (*Radioactive isotopes, *Medicine), Therapy, Diagnosis, Questionnaires, Radiation effects, Exposure, Safety, Medical personnel, Labeled substances, Tables, Radiobiology, Scanning, Medical research, Classification, Diagnostic agents, Statistical analysis.

The Phase I study, which was a national survey of all licensed and registered medical users of radionuclides, required the compilation of a comprehensive registry of physicians using radionuclides for medical purposes, and the development of a survey questionnaire. The survey questionnaire was designed to determine a physician's usage of radionuclides in diagnostic, therapeutic, and research procedures in 1966. The diagnostic procedures included function studies (in vitro and in vivo), and scanning studies. The therapeutic procedures included radiopharmaceutical therapy, brachytherapy, and teletherapy. In the Phase II study, the practice of diagnostic nuclear medicine was described with particular emphasis on those measures that minimize patient radiation exposure. A statistical approach using a sampling of practitioners as the data source was employed. A survey questionnaire was designed to obtain data on radiopharmaceutical handling, patient safeguards, and instrument calibration practices. (Author)

PB-188 690
Bureau of Radiological Health, Rockville, Md. Office of Criteria and Standards.
RADIATION EXPOSURE OVERVIEW: MICROWAVE OVENS AND THE PUBLIC,
Marvin Rosenstein, Warren A. Brill, and Charles K. Showalter. Jul 69, 30p OCS-69-1

Descriptors: (*Microwave equipment, *Radiation hazards), Furnaces, Exposure, Standards, Radiation effects, Measurement, Detection, Control.
Identifiers: *Microwave ovens.

The overview focuses on the radiation exposure of users of microwave ovens. Possible hazards associated with this exposure and general control activities needed for further reducing the potential for radiation effects are singled out. (Author)

PB-188 691
Bureau of Radiological Health, Rockville, Md. Div. of Environmental Radiation.
EVALUATION OF RADON 222 NEAR URANIUM TAILINGS PILES.

Mar 69, 73p DER-69-1

Descriptors: (*Uranium, Material removal), (*Radioactive isotopes, Radon), (*Radon, Radiological contamination), Collecting methods, Dose rate, Radioactive waste.
Identifiers: Tailings.

The results of a yearlong study to evaluate the public health aspects of atmospheric radon 222 concentrations in the vicinity of uranium mill tailings piles are presented. Samples were collected from 13 onpile and 44 offpile stations in the four study cities of Grand Junction and Durango, Colo., and Monticello and Salt Lake City, Utah. The tailings pile at Monticello has been covered and stabilized; the other three are uncovered and unstabilized. The side slopes of the pile at Grand Junction are partially stabilized with a grass cover. A technique for taking integrated air samples for radon near uranium tailings piles has been developed, tested, and proven through use in the field. Atmospheric concentrations of radon in areas near uranium tailings piles have been evaluated as an index to radiation exposure of the population. The results indicate no significant radiation exposure to the public from this source. (Author)

PB-188 703
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
A FIELD METHOD FOR THE DETERMINATION OF LEAD IN GLASS USED FOR SHIELDING TELEVISION RECEIVER COMPONENTS,
Harry Levine, and Paul S. Ruggera. Dec 69, 16p* DEP-69-2

Descriptors: (*Color television, *X rays), (*Lead, Chemical analysis), Iodides, Electromagnetic shielding, Glass.
Identifiers: *Lead glass, Hydrofluoric acid.

The transmission of X-rays through the glass envelopes of certain types of television tubes, or through the glass covering X-ray fluoroscopic screens, is influenced by the amount and type of high atomic number elements in the glass. Interest in this aspect of the subject was stimulated by recent findings that color television receivers have been shown to emit X-radiation. These emissions have been found to originate from picture tubes, shunt regulator tubes, and high voltage rectifier tubes. When conducting inspections of equipment where transmission of X-radiation is in question, it is useful for the inspector to know the composition of the glass so that its ability to absorb X-rays may be estimated. Lead is the element most commonly used in glass for its radiation attenuation. A rapid, semi-quantitative method for the detection and estimation of lead in glass, suitable for use in the field, has been developed. It is based on the action of a mixture of hydrofluoric acid and sodium iodide on lead contained in glass and ceramics. Important features of this test are that the reaction can be evaluated in a matter of minutes in the field without causing visible damage to the specimen, and the elimination of the conventional chemical analysis that is generally performed in the laboratory. It will show at once whether lead is present in appreciable amounts or is essentially absent.

PB-188 974
Bureau of Radiological Health, Rockville, Md. Div. of Biological Effects.
EVALUATION OF A POSSIBLE CAUSAL RELATIONSHIP BETWEEN FALLOUT DEPOSITION OF STRONTIUM 90 AND INFANT AND FETAL MORTALITY TRENDS,
Edythalena Tompkins, and Morton L. Brown. Oct 69, 43p DBE-69-2

Descriptors: (*Radioactive fallout, Mortality rates), (*Infants, Mortality rates), (*Embryos, Mortality rates), Strontium, Children, Leukemia, Radiological contamination, Tables, Statistical analysis, Milk, Experimental design, Reviews.

As early as 1963, Dr. Ernest J. Sternglass expressed his belief that radiation due to deposited radionuclides from fallout has increased the burden of diseases, such as leukemia, and altered the trend of infant and fetal mortality in the United States. More recently, through public forums, published articles, and presentations at scientific meetings, Dr. Sternglass has given added emphasis to what he considers a highly significant and disturbing finding in changing patterns of infant and fetal mortality, which he has attributed primarily to levels of 90Sr in the environment. Because of the magnitude of the problems implied in these allegations, the Public Health Service conducted an evaluation of the reports written by Dr. Sternglass. This critique, based primarily on Dr. Sternglass' report given at the 9th Annual Hanford Biology Symposium on May 5-8, 1969, in Richland, Washington, resulted in a failure to agree with the scientific approach used by Dr. Sternglass in evaluating the data he has utilized in his report. (Author)

PB-189 084
Columbia Univ., New York. Radiological Research Lab.
THE EFFECTS OF IONIZING RADIATION ON THE DEVELOPING EMBRYO AND FETUS,
Roberts Rugh. 1969, 35p
Presented at the National Center for Radiological Health's Seminar Program, Rockville, Md., 14 Feb 69.

Descriptors: (*Radiation effects, *Embryos), Exposure, X rays, Pregnancy, Anomalies, Reproductive system, Radiological dosage, Sensitivity, Embryology.
Identifiers: *Congenital abnormalies.

A discussion is given of the relative radiation sensitivity of the embryo and fetus at various stages of development and also a comparison with the somatic tissues of the adult; the congenital anomalie which one might expect following certain levels of exposure at various gestational ages; the extent to which it is possible to extrapolate animal exposure data to the human and general recommendations regarding the exposure of the human gravid uterus. (Author)

PB-189 141
Eberline Instrument Corp., Santa Fe, N. Mex.
EVALUATION OF RADIUM CONTAMINATION IN AIRCRAFT INSTRUMENT REPAIR FACILITIES.
Environmental health series,
Eric L. Geiger, and Gail D. Schmidt. May 69, 48p
PHS-Pub-999-RH-36
Contract PH-86-67-66

Descriptors: (*Flight instruments, Maintenance), (*Radium, Flight instruments), (*Test facilities, Radiological contamination), Health physics, Alpha particles, Decontamination, Radioactive waste, Disposal, Radiological dosage, Technicians.
Identifiers: *Radium luminous dials, Radium dial instruments.

Dial-stripping operations in aircraft instrument repair facilities have caused alpha-particle contamination levels exceeding 100,000 disintegrations per minute/100 cm square. Existing radium control programs in these facilities are inadequate. Instrumentation, training, and assistance for decontamination and waste disposal are needed in most of the facilities surveyed. Two workers in the facility with the highest levels of contamination had body burdens in excess of 40 percent of the maximum permissible body burden of radium, and a third worker had a possible body burden of about 14 percent. Workers in all other facilities included in the study had less than 10 percent of the maximum permissible body burden. A recommended control program for aircraft instrument repair facilities is described. Decontamination of one aircraft instrument repair facility was conducted to evaluate decontamination methods for floors, benches, and equipment. (Author)

PB-189 142
Bureau of Radiological Health, Rockville, Md.
REGULATIONS, STANDARDS, AND GUIDES PERTAINING TO MEDICAL AND DENTAL RADIATION PROTECTION -- AN ANNOTATED BIBLIOGRAPHY.
Environmental health series,
David R. Snavely, Larry G. Kumbier, Mark J. Thompson, and Lloyd R. Setter. Jun 69, 85p*
PHS-Pub-999-RH-37

Descriptors: (*Radiation hazards, Bibliographies), (*Radiography, Standards), Radiation measurement systems, Medical equipment, Design, X rays, Exposure, Radiation monitors, Gamma rays, Health physics, Medicine, Dentistry.

This report is an annotated bibliography of standards, regulations, and guides pertaining to medical and dental ionizing radiation protection. Included are annotations of general standards, guides and recommendations; standards on the safe operation, handling, and design of radiation equipment and sources; and standards and guides pertaining to radiation measurement. Since the terminology for regulations, standards, and guides is not uniform among the Federal and State governments, military organizations, and nongovernmental organizations, the annotated documents are designated as Class A (established or adopted by a governmental body acting under the authority of an act, law, or statute), Class B (adopted by consensus of a committee (s) or commission (s) of technical competence in standards-setting organizations), or Class C (not adopted by a standards-setting organization, but contains information pertinent to the preparation of suitable standards or regulations). The annotations include identification of the document, type of standard, intended complier, intended benefitter, limits and specifications, and general guidance. (Author)

PB-189 157
Puerto Rico Univ., Mayaquez. Water Resources Research Inst.
THE MANAGEMENT AND CONTROL OF WATER IN PUERTO RICO.
Technical research project completion rept.,
Isidoro Aviles Cordero. Sep 69, 223p W70-03246,
OWRR-A-010-PR (1)

Descriptors: (*Water supplies, Management planning), (*Puerto Rico, Water supplies), Irrigation systems, Sewage, Water pollution, Floods, Law, Evapotranspiration, Hydrology.
Identifiers: Water resources, Water rights, Sewage treatment, Surface waters, Ground water, Flood control.

The present status of water resources management in Puerto Rico is reviewed. Topics discussed include the island's hydrology, streamflow, water availability, water use, water rights, predictions of future needs, water problems, and recommendations. The major problems are pollution control, reservoir sedimentation, flood control, irrigation needs, drainage, and salt water intrusion. Puerto Rico is rapidly industrializing and must solve these problems to continue increasing the standard of living. (USGS abstract)

PB-189 160
Georgia Kraft Co., Rome. Research and Development Center.
FOAM SEPARATION OF KRAFT PULPING WASTES.
Final rept.

Oct 69, 80p* FWPCA-DAST-3 FWPCA-12040-EUG-10/69, W70-03350
Grant WPRD-117-01-68
Water pollution control research series.

Descriptors: (*Water pollution, *Paper industry), (*Wastes (Industrial), *Wood pulp), Foams, Surface-active substances, Economics.
Identifiers: *Kraft paper, Biochemical oxygen demand, *Sulfate pulping, Tall oil.

Laboratory studies of foam separation were conducted to determine the feasibility of this process for reducing B.O.D., solids content, and foaming tendency of clarified kraft mill effluent. Since kraft pulping wastes have a natural tendency to foam, it was expected that the foaming process, which has been found to be useful in treating domestic wastes, might have applications in treatment of these effluents. Both continuous flow and batch experiments were conducted, and liquid and foam heights, liquid feed rates, air sparging rates, and temperature were varied over wide ranges. The B.O.D. reduction in the treated liquid was disappointingly small, averaging less than 5 per cent, and the B.O.D. enrichment in the foam phase was in most cases less than 1.5 times that of the feed. Foaming tendency, however, was significantly reduced by the intentional foaming process. The experimental results suggest that the reductions in B.O.D. and foaming tendency were related to the separation of the tall oil components of the waste. Apparently the remaining B.O.D.- producing materials were not surface active and did not attach themselves to the surface-active components. The cost of using a foam process on kraft mill wastes is estimated to be four to five cents per 1000 gallons of feed; this cost is exclusive of further processing of the concentrated foamate. Based on control of foaming tendency alone, the process would be unattractive from a cost standpoint. (Author)

PB-189 169
California Univ., Berkeley. Sanitary Engineering Research Lab.
ECONOMIC EVALUATION OF WATER.
Final rept.,
P. H. McGauhey, and E. J. Middlebrooks. Nov 69, 126p* SERL-69-8 FWPCA-16090-DLU-11/69, W70-03428
Grant FWPCA-WP-00597-06

Descriptors: (*Water pollution, Control), Mathematical models, Quality control, Concentration (Chemistry), Oxygen, Linear programming, Harbors, Economics, Wastes (Industrial), Wastes (Sanitary engineering), Disposal, Costs, California.
Identifiers: Water resources, Estuaries, San Francisco Bay, Waste water, Water treatment.

The tendency to set quality of the water resource rather than quality of discharges as the objective of environmental control makes it necessary to develop some relationship between concentration of individual pollutants in the resource and in the discharge in terms of characteristics of the receiving estuary. Moreover, the growing percentage of the water resource which is degraded in quality through beneficial use together with the increasing investment necessary to restore water quality, makes it important to minimize the cost of achieving water quality objectives. The study makes use of modern mathematical models, programming techniques, and input-output analysis to optimize quality control systems; and illustrates the use of the models by examples drawn from San Francisco Bay data and quality requirements. (Author)

PB-189 172
Federal Water Pollution Control Administration, Edison, N.J. Northeast Region Research and Development Program.
CLEANING OIL CONTAMINATED BEACHES WITH CHEMICALS.
Water pollution control research series.

Aug 69, 30p* FWPCA-DAST-27 FWPCA-15080-FHS-08/69, W70-03349
Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Beaches, *Petroleum), (*Water pollution, *Oils), Sand, Cleaning compounds.
Identifiers: *Oil spills, *Oil pollution, *Crude oil, *Dispersants, Emulsifying agents.

Oil-dispersing chemicals were treated for cleaning persistent-type crude oil from experimentally contaminated New Jersey coastal beaches and were found to be generally ineffective. Although they completely cleaned the surface of the oiled sand, they removed little of the total oil. Instead they caused the oil to penetrate more deeply into the underlying sand, thereby compounding the pollution problem by expanding the zone of pollution, complicating any subsequent mechanical removal and, possibly, causing the oil to persist longer. Chemical treatment failed to induce 'quicksand' or cause perceptible erosion of beach sand. A decrease in the 'cohesiveness' of the sand was observed, but this also occurred in the presence of oil alone and could not be attributed to the presence of chemical. (Author)

PB-189 232
Washington Univ., Seattle. Dept. of Civil Engineering.
CURRENT PRACTICE IN POTATO PROCESSING WASTE TREATMENT.
Water pollution control research series,
Kristian Guttormsen, and Dale A. Carlson. Oct 69, 117p* FWPCA-DAST-14 W70-03433,
FWPCA-12060-10/69
Grant FWPCA-WP-01486-01

Descriptors: (*Wastes (Industrial), *Potatoes), (*Water pollution, Control), Industrial plants, Sewage, Costs, Bibliographies.

Potato processing, waste treatment, and current and needed research in water quality control in this production field are discussed. A brief description is given of general characteristics of the potato and the effects and importance of cultural and environmental conditions on potato processing. General descriptions of the production processes are included and the literature is extensively reviewed to present current and proposed waste treatment technology. The most urgent research needs are discussed together with suggested methods for meeting these needs. (WRSIC abstract)

PB-189 233
Harvard Univ., Cambridge, Mass.
OXYGENATION OF FERROUS IRON: THE RATE-DETERMINING STEP IN THE FORMATION OF ACIDIC MINE DRAINAGE.
Final progress rept. 1 Apr 66-31 Dec 68,
Philip C. Singer, and Werner Strumm. Dec 68, 218p FWPCA-DAST-28 FWPCA-14010-06/69, W70-03434
Contract PH-36-66-107

Descriptors: (*Iron compounds, *Oxidation), (*Water pollution, *Iron), (*Pyrites, Water pollution), Sulfides, Acids, Theses.
Identifiers: *Mine waters, Iron sulfides.

The rate of oxidation of iron (II) by oxygen conforms to a relationship which is first-order in the concentrations of ferrous iron and oxygen, and second-order in the concentration of hydroxide ion, at pH values between 6.0 and 7.5. The reaction proceeds relatively rapid at pH values greater than 6.5; the half-time of the reaction is 4 minutes at pH 7.0, under a partial pressure of oxygen of 0.20 atmospheres at 25 deg C. The dependence of the oxidation rate on hydroxide concentration has been observed, in this study, at pH values as low as 4.5, where the half-time has increased to approximately 300 days. At lower pH values, the dependence of the reaction rate on pH becomes less marked until at pH values below 3.5, the oxidation proceeds at a rate which is independent of pH. Field results suggest that the observed rapidity of the reaction in acidic mine waters is apparently the result of microbial catalysis. The rate-limiting step among the reactions involved in the oxidation of iron pyrite and the production of acidity in mine drainage waters is the oxygenation of ferrous iron. Oxidation of iron pyrite is by a cyclical reaction involving the slow oxygenation of iron (II) to iron (III) followed immediately by the rapid reduction

of iron (III) by pyrite, generating in turn more iron (II) and acidity. (WRSIC-abstract)

PB-189 295
General American Transportation Corp., Niles, Ill.
MATHEMATICAL MODEL OF SEWAGE SLUDGE FLUIDIZED BED INCINERATOR CAPACITIES AND COSTS,
G. J. Ducar, and P. Levin. Sep 69, 84p* TWRC-10
W70-03610, FWPCA-17090-09/69
Grant FWPCA-14-12-415

Descriptors: (*Wastes (Sanitary engineering), *Incinerators), (*Fluidized bed processes, *Sewage), Mathematical models, Oxidation, Computer programs, Costs.
Identifiers: *Sewage disposal.

The development of a computer program to evalute sewage sludge fluidized bed incineration systems is described. Data for the program was collected from manufacturers, a literature survey and field trips to operating installations. Most of the data was obtained from the field because of the lack of available information from the other sources. More than fifty correlation relationships were attempted before the necessary data could be reasonably represented. Equations were developed for the least square curves which fitted the data best. These equations were used as the basis for the computer program developed to size some of the major components and to estimate capital, operating and maintenance costs for the fluidized bed incineration system. (Author)

PB-189 342
Public Health Service, Washington, D.C. Div. of Radiological Health.
MATHEMATICAL PROGRAMMING MODELS FOR SELECTION OF DIETS TO MINIMIZE WEIGHTED RADIONUCLIDE INTAKE.
Environmental health series,
Jerome Bracken. Aug 63, 25p PHS-Pub-999-R-4

Descriptors: (*Food, *Radiological contamination), (*Diet, Mathematical models), Radioactive isotopes, Ingestion (Physiology), Nutrition, Data processing systems.

Some motivating and background material underlying the formulation of the models is presented. Several mathematical programming models for selecting diets to minimize radionuclide intake are formulated, of which the most attractive seems to be for minimizing linearly weighted radionuclide intake. An example is given of the application of one of the models using published data of radionuclide content of foods. (Author)

PB-189 343
Public Helath Service, Washington, D.C. Div. of Radiological Health.
AN ENVIRONMENTAL SURVEILLANCE LABORATORY FOR RADIONUCLIDE ANALYSES. PART I. ESTABLISHMENT OF AN ENVIRONMENTAL SURVEILLANCE LABORATORY: A CASE STUDY. PART II. ANALYSIS OF LARGE NUMBERS OF MILK SAMPLES FOR FISSION PRODUCTS.
Environmental health series,
Edmond J. Baratta, Donald C. Parks, Dade W. Moeller, and Marvin Rosenstein. Jul 64, 44p PHS-Pub-RH-7

Descriptors: (*Radiochemistry laboratories, Health physics), (*Radiological contamination, Detection), (*Milk, Radiological contamination), Water, Food, Monitors, Radioactive isotopes, Radioactive fallout, Environment.

The planning, establishment, and operation of a Public Health Service laboratory for radiation measurement and surveillance are described. Part I discusses the facilities, personnel requirements, equipment, and analytical capacities of the laboratory. Part II deals with the techniques of handling large numbers of milk samples for analysis of fission-product activity. Operational factors are considered, including intralaboratory quality control and time studies based on workload and laboratory capacity. (Author)

PB-189 344
Florida State Board of Health, Bartow. Div. of Radiological and Occupational Health.
X-RAY EQUIPMENT SURVEY IN POLK COUNTY, FLORIDA, SEPTEMBER 1961-AUGUST 1963.
Environmental health series,
Edgar P. Seagle. Sep 64, 102p PHS-Pub-990-RH-8
Contract PH-86-62-14

Descriptors: (*Medical equipment, *Radiation hazards), (*X-ray photography, Radiation hazards), Diagnosis, Exposure, X rays, Statistical data, Radiological contamination, Florida.
Identifiers: *Radiology, *X ray apparatus.

A field study concerned with human patient exposure in x-ray diagnosis was conducted in Polk County, Fla. The study included physical surveys of 91.5 percent of diagnostic x-ray equipment in the county in use by all categories of practitioners of the healing arts. The methodology used is described in detail and discussed, along with the keeping of patient data records, measuring of acceptance of recommendations, devising an improved means of communicating with the practitioner, limited measuring of radiation exposure reduction to the population, and transferring of findings to data processing cards. (Author)

PB-189 345
Public Health Service, Washington, D.C. Div. of Radiological Health.
AN EMANATION SYSTEM FOR DETERMINING SMALL QUANTITIES OF RADIUM-226.
Environmental health series,
Richard L. Blanchard. Nov 64, 26p PHS-Pub-999-RH-9

Descriptors: (*Radium, *Microanalysis), (*Radon, *Scintillation counters), Chemical analysis, Radioactive isotopes.
Identifiers: Radium 226.

A detailed account is given of the construction, operation, and characteristics of an emanation system for the determination of radium-226. The method is specific for radium-226, is well suited for large volume samples containing small quantities of this nuclide, and will accommodate any type of sample that can be prepared in an aqueous solution. The limit of detection at the 95-percent confidence level was calculated to be 0.016 picograms of radium-226, and the transfer and collection of radon-222 was determined to be 100 percent with an average deviation of 3 percent. (Author)

PB-189 346
Public Health Service, Washington, D.C. Div. of Radiological Health.
BEHAVIOR OF CERTAIN RADIONUCLIDES RELEASED INTO FRESH-WATER ENVIRONMENTS.
Annual rept. 1959-1960,
Albert G. Friend, Albert H. Story, Croswell R. Henderson, and Kenneth A. Busch. Jun 65, 100p
PHS-PUB-999-RH-13
Contract AT (49-5)-1288

Descriptors: (*Radioactive isotopes, Distribution), (*Rivers, *Radiological contamination), Environment, Aquatic animals, Fishes, Plankton, Sampling, Algae, Hydrology, Geology.

Radionuclides from various sources, including facilities that produce, process, and handle nuclear material, are entering the fresh-water environment. The Service's Division of Radiological Health, in cooperation with the Atomic Energy Commission, has conducted a number of investigations of streams below atomic energy installations. Two such studies, one on the Mohawk River near Knolls Atomic Power Laboratory, and the other on the Clinch and Tennessee Rivers near the Oak Ridge National Laboratory, are presented in this document. In general, the results show that all segments of the aquatic environment related to these rivers contain measurable quantities of man-made radionuclides. The results of some uptake studies, carried out in a DRH laboratory, are included to supplement the river studies and to aid in interpreting the results obtained in the field. (Author)

PB-189 347
National Center for Radiological Health, Rockville, Md.
IODINE 131 IN CHILDREN'S THYROIDS FROM ENVIRONMENTAL EXPOSURE.
Environmental health series,
Henry N. Wellman, Gerald J. Karches, Warren G. Hansen, Gerald R. Laurer, and Merril Eisenbud.
May 67, 31p PHS-Pub-999-RH-14
Prepared in cooperation with New York Univ., N.Y.

Descriptors: (*Radiological contamination, *Thyroid gland), (*Iodine, Thyroid gland), Metabolism, Children, Environment, Exposure, Milk, Diet, Radioactive isotopes.

Balance studies of environmental iodine 131 over a period of 30 days are reported in children ranging from 1 to 6 years of age. Calculations of expected thyroidal accumulations of iodine 131, based on accepted exponential models and thyroid function factors, are compared with thyroidal iodine 131 measurements performed in a low-background facility. The measured values were lower by a factor of 2 than the calculated accumulation of iodine 131, suggesting a lesser uptake and/or more rapid turnover of iodine in children. The difficulties involved in this type of environmental study and recommendations for improved methodology are discussed. (Author)

PB-189 348
Public Health Service, Washington, D.C. Div. of Radiological Health.
QUALITY CONTROL OF RADIOACTIVITY-COUNTING SYSTEMS.
Environmental health series,
H. E. Kolde. Aug 65, 25p PHS-Pub-999-RH-15

Descriptors: (*Radiation measurement systems, Quality control), Reliability, Calibration, Standards, Background, Tests.

Techniques for obtaining satisfactory performance from radioactivity-counting systems are described. Acceptable performance is maintained by routine tests of background and standards combined with the application of statistical criteria of acceptability. The use of control charts in conjunction with the test data is recommended to facilitate determination of satisfactory instrument and sample measurements. Corrective adjustments are made when necessary to assure continuity of reproducible results, which is particularly important for long-term studies. Methods of chart application and interpretation of plot patterns are outlined. Requirements for the design of counting laboratories, suitable performance standards, and associated control measures are also discussed. (Author)

PB-189 349
Public Health Service, Washington, D.C. Div. of Radiological Health.
MEDICAL USES OF RADIUM AND RADIUM SUBSTITUTES.
Environmental health series.
Jul 65, 64p PHS-Pub-999-RH-16
Conference on Medical Uses of Radium and Radium Substitutes held at the Center for Continuing

Education, Chicago Univ., Ill., 3-4 Sep 64, summary and conclusions.

Descriptors: (*Radioactive isotopes, Radiotherapy), (*Radiotherapy, Radiation hazards), (*Radium, Radiation hazards), Protection, Accidents, Medicine, Standards, Implants, Radiation tolerance, Safety, Symposia.

Representatives from professional medical societies, leading therapy centers, and governmental agencies attended a 2-day conference, September 3-4, 1964, sponsored by the Division of Radiological Health of the Public Health Service, to discuss programs dealing with the management of radium and radium substitutes for medical uses. The discussions were excerpted from the transcript and organized under the five conclusions reached by the conference. These conclusions indicate a need for comprehensive regulatory programs for radium, sealed source design standards for radium, adoption of suitable radium substitutes, research efforts toward developing better and safer sealed sources, and promotion of therapeutic techniques that will reduce radiation exposure to medical personnel. (Author)

PB-189 350
Public Health Service, Washington, D.C. Div. of Radiological Health.
RADIONUCLIDE ANALYSIS OF LARGE NUMBERS OF FOOD AND WATER SAMPLES.
Environmental health series,
Esther Ferri, Paul J. Magno, and Lloyd R. Setter.
Dec 65, 37p PHS-Pub-999-RH-17

Descriptors: (*Radiological contamination, Measurement), (*Food, Radiological contamination), (*Water, Radiological contamination), Diet, Permissible dosage, Spectroscopy, Radiochemistry, Radium, Strontium, Radioactive isotopes.

As part of the responsibilities of the Division of Radiological Health for environmental surveillance, large numbers of samples are analyzed for gross and specific radioactivity. The processing of food and water samples is described. Included are manpower and equipment requirements, and technical procedures for measurements of appropriate radio activities. Procedures described include techniques for a series of radionuclides, as well as certain stable elements in food, and for gross alpha and beta determinations, gamma spectral analyses, and radium 226 and strontium 90 in water. (Author)

PB-189 351
Public Health Service, Washington, D.C. Div. of Radiological Health.
MORTALITY OF NEW ENGLAND DENTISTS, 1921-1960.
Environmental health series,
Robert L. Glass. May 66, 80p PHS-Pub-999-RH-18

Descriptors: (*Dental personnel, *Mortality rates), (*Radiation hazards, Dental personnel), Epidemiology, Exposure, Radiation effects, X rays, Life span, Statistical data, Cancer.

An epidemiological study was conducted to determine the mortality of dentists in comparison with that of the general population and of physicians. A cohort of 11,478 white male dentists practicing in New England from 1921 to 1960 has been identified from the records of the State licensing authorities. Leukemia mortality has approximated that expected from several sets of standard rates, both in the entire cohort and in that group entering dental practice prior to 1921. Mortality from all causes has been less than that expected from death rates of the New England white male population and U.S. physician population, but greater than that of certain medical specialists. Cancer mortality has been significantly less than, and mortality from cardiovascular diseases about equal to, that of the general population. Suicide is the only cause of death with greater than expected mortality throughout the study period. No relationship between mortality and exposure to ionizing radiation was observed. (Author)

PB-189 357
National Center for Radiological Health, Rockville, Md.
RADIOASSAY PROCEDURES FOR ENVIRONMENTAL SAMPLES.
Environmental health series.
Jan 67, 493p* PHS-Pub-999-RH-27

Descriptors: (*Radioactive fallout, *Chemical analysis), (*Milk, Radiological contamination), (*Food, *Radiological contamination), (*Water pollution, *Radioactive isotopes), (*Air pollution, Radioactive isotopes), Gamma-ray spectra, Radiation measurement systems, Scintillation counters, Radon, Geiger counters, Strontium, Barium, Complex compounds, Volumetric analysis, Uranium, Iodine, Instruction manuals.
Identifiers: Spectroscopic analysis.

The report is a manual of methods used in laboratories of the Public Health Service's National Center for Radiological Health of the Bureau of Disease Prevention and Environmental Control for the determination and interpretation of the radionuclide content of samples collected for environmental surveillance. Step by step procedures are given for the analysis of milk, food, air, water, and other environmental samples. A discussion of instrumentation for these procedures is given, and a program of analytical quality control is described. Appendices include a definition of laboratory practice and terminology and instructions for preparing required reagents. Bibliographic references are included for specific procedures as well as for more general discussions. (Author)

PB-189 359
Georgia Dept. of Public Health, Atlanta.
GEORGIA RADIUM MANAGEMENT PROJECT.
Environmental health series,
James S. Benson, Richard H. Fetz, Cecil D. Posey, and Earl W. Robinson. Jan 69, 96p
PHS-Pub-999-RH-34

Descriptors: (*Radiation hazards, Medicine), (*Radium, Radiation hazards), Safety, Storage, Protection, Radiation monitors, Dosimeters, Radiation effects, Public health, Radiological contamination, Exposure.

The investigation concerned an assessment of (a) the extent and types of radium usage in the practice of medicine, (b) adequacy of radiation safety procedures and equipment employed in handling, storing, and using radium sources, (c) leakage of radium sources, and (d) contamination resulting from use of radium in medicine. Phase I of the project surveyed the hospitals of Georgia, and Phase II surveyed medical offices and clinics. Radiological health practices related to the use of radium in most of the hospitals were below acceptable standards. General and specific findings for radiological health practices in medical offices and clinics are presented. Hospitals, medical offices, and clinics were generally unaware of radium contamination insurance. A study of radium contamination insurance is included. (Author)

PB-189 360
Bureau of Radiological Health, Rockville, Md.
REGULATIONS, STANDARDS, AND GUIDES FOR MICROWAVES, ULTRAVIOLET RADIATION, AND RADIATION FROM LASERS AND TELEVISION RECEIVERS - AN ANNOTATED BIBLIOGRAPHY.
Environmental health series,
Lloyd R. Setter, David R. Snavely, Duane L. Solem, and Rodman F. Van Wye. Apr 69, 84p*
PHS-Pub-999-RH-35

Descriptors: (*Radiation hazards, Bibliographies), (*Lasers, Radiation hazards), (*Television receivers, Radiation hazards), Standards, Safety, Microwaves, Exposure, X rays, Ultraviolet radiation, Masers, Public health, Protection, Abstracts.

This report is an annotated bibliography of guidelines, standards, and regulations pertaining to public health protection against electromagnetic radiation from television receivers, lasers, ultraviolet radiation, and microwaves. Each category of radiation is treated in a separate section. The annotated documents are designated as Class A (established or adopted by a governmental body acting under the authority of an act, law, or statute), Class B (adopted by consensus of a committee (s) or commission (s) of technical competence in standards-setting organizations), or Class C (not adopted by a standards-setting organization, but contains information pertinent to the preparation of suitable standards or regulations). The annotations include identification of the document, type of standard, intended compiler, intended benefitter, limits and specifications, and general guidance. (Author)

PB-189 361
Public Health Service, Washington, D.C. Div. of Radiological Health.
RADIONUCLIDE ANALYSIS OF GAMMA-RAY SPECTRA BY STEPWISE MULTIPLE REGRESSION.
Environmental health series,
Robert H. Shumway. 1963, 26p PHS-Pub-999-R-5

Descriptors: (*Radioactive isotopes, Gamma-ray spectroscopy), (*Gamma-ray spectra, *Regression analysis), Gamma emission, Identification, Least squares method, Health physics, Radiological contamination.

A modification of the usual multiple regression method is described for use in analyzing a gross gamma spectrum from an unknown solution containing many radionuclides. It involves a stepwise multiple regression procedure that sequentially tests the effect of each radionuclide until the spectrum is resolved. The principal advantages over the 'spectrum stripping' or conventional multiple regression are that the procedure: (a) requires no a priori assumptions about the radionuclide content of the solution, and (b) utilizes the information in all of the channels simultaneously. (Author)

PB-189 362
Texas Nuclear Corp., Austin.
TRITIUM CONTAMINATION IN PARTICLE ACCELERATOR OPERATION.
Environmental health series,
Donald O. Nellis, Emmett L. Hudspeth, Ira L. Morgan, Patricia S. Buchanan, and Richard F. Boggs. Nov 67, 55p PHS-Pub-999-RH-29
Contract PH-86-66-168

Descriptors: (*Particle accelerator targets, Tritium), (*Tritium, *Radiological contamination), Cockroft-Walton accelerators, Radiation hazards, Health physics, Deuteron bombardment, Particle accelerator components, Vacuum pumps, Van de Graaff generators, X-ray spectroscopy, Autoradiography, Safety.

Tritium-metallic targets are frequently used in many particle accelerators for the production of high-energy neutrons. The purpose of this study was to investigate the problems and hazards associated with the use of these tritium targets so that appropriate steps can be taken to minimize the potential radiological health hazards. Particular emphasis was placed on the operation of Cockcroft-Walton neutron generators, since these constitute a high percentage of such particle accelerators which utilize the tritium-metallic targets. The study showed that bombardment of tritium targets results in the loss of about 1 tritium atom for each bombarding deuteron, and that most of the tritium is in a gaseous form when it leaves

the target. It was also determined that a relatively small amount of the tritium released from the target actually remains within the accelerator itself. Most of the tritium lost by a bombarded target is trapped in the elements of an ion pump or released through the vacuum system exhaust. (Author)

PB-189 363
Bureau of Radiological Health, Rockville, Md.
GUIDELINES TO RADIOLOGICAL HEALTH.
Environmental health series.
Sep 68, 185p PHS-Pub-999-RH-33
Presented at the International Conference at McGill Univ., Montreal (Quebec), Aug 67.

Descriptors: (*Health physics, Symposia), (*Public health, Symposia), Radiation injuries, Radiation hazards, Radiation effects, Radiological contamination, Ecology, Radiological dosage, Radiotherapy, Diagnosis, Food, Radioactive isotopes, Metabolism, Cells (Biology), Genetics, Epidemiology, Industrial medicine, Sources, Safety.

Under the sponsorship of the U.S. Department of Health, Education, and Welfare, Public Health Service, National Center for Radiological Health, and the Department of National Health and Welfare, Radiation Protection Division, Ottawa, Canada, the International Conference on 'Guidelines to Radiological Health' was held at McGill University, Montreal, Quebec, Canada, August 1967, to discuss radiological health problems, as presented by a group of experts. Speakers from the United States, Canada, Great Britain, and Japan presented papers on three major topics: Radiation Injury, Preventive Measures, and Sources of Radiation and Epidemiology, and included the fields of diagnostic and therepeutic radiation, industrial exposure to radiation, changes induced by irradiation of nutritional elements, and radioecological concentration processes. (Author)

PB-189 364
Saint Louis County Health Dept., Mo.
FARMING PRACTICES AND CONCENTRATIONS OF FISSION PRODUCTS IN MILK.
Environmental health series,
Warren G. Hansen, Jeptha E. Campbell, Jack H. Fooks, H. Clifford Mitchell, and C. Howe Eller.
Jul 68, 50p PHS-Pub-999-R-6
Contract SAph-73763
Revision of report dated May 64.

Descriptors: (*Radiological contamination, *Milk), Strontium, Iodine, Control, Missouri, Bovines, Grasses, Fertilizers, Radioactive isotopes.

Studies conducted over a 3-year period have shown that levels of strontium-90 and iodine-131 in milk can be moderated by optimal fertilization of the land. In controlled experiments, milk from cows grazing on abundant, well-fertilized pastures contained 50 percent or less of these radionuclides than did milk from cows grazing on unfertilized pastures on the same farm. A mechanism of dilution of the fission-product contamination in the larger volume of faster growing fertilized forage was shown to account for the differences in the milk. The findings suggest one possible means of controlling fission-product contamination in milk, if such control measures should be necessary. The results indicate that the high levels of strontium-90 in the St. Louis raw milk samples may have been due more to marginal fertilization of the farms than to uneven deposition of fallout. (Author)

PB-189 405
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
EVALUATION OF OPERATING PARAMETERS OF ALUMINA COLUMNS FOR THE SELECTIVE REMOVAL OF PHOSPHORUS FROM WASTE-WATERS AND THE ULTIMATE DISPOSAL OF PHOSPHORUS AS CALCIUM PHOSPHATE,
L. L. Ames. Mar 69, 40p* TWRC-AWTRL-8 W70-03612, FWPCA-17010-02/69
Contract FWPCA-14-12-413

Descriptors: (*Wastes (Sanitary engineering), *Phosphates), Adsorption, Alumina, Sewage, Calcium compounds, Separation.
Identifiers: *Sewage treatment, *Absorbers (Equipment), Columns (Process engineering), Beds (Process engineering).

A synthetic secondary sewage effluent containing 10 to 30 mg/liter phosphate, 300 mg/liter bicarbonate, 112 mg/liter Cl and 50 mg/liter sulfate as anions and 130 mg/liter Na, 60 mg/liter Ca, 25 mg/liter each of K and Mg and 20 mg/liter ammonium as cations was used with 7.6 ml alumina columns to study the effects of various compositional changes on phosphorus removal. The phosphorus capacity was about half for the solution containing no Ca or Mg as compared to solutions containing them. Probably adsorption onto the alumina occurs partly as a calcium or magnesium phosphorus complex rather than as a simple phosphorus anion. Increasing the competing sulfate concentration in the influent solution to 4800 mg/liter showed little effect on phosphorus adsorption. Raising the pH of the synthetic sewage effluent to greater than 8.0 led to precipitation of calcium carbonate on the alumina grains which progressively lowered alumina phosphorus capacity. This problem was not encountered when using actual sewage effluent. It was found that alumina columns could be satisfactorily regenerated with NaOH. (WRSIC abstract)

PB-189 507
Public Health Service, Washington, D.C. Div. of Radiological Health.
ROUTINE SURVEILLANCE OF RADIOACTIVITY AROUND NUCLEAR FACILITIES.
Interlab Technical Advisory Committee rept.

Dec 66, 39p ITAC-1, PHS-Pub-999-RH-23

Descriptors: (*Radiological contamination, Measurement), Radioactive waste, Fission products, Disposal, Water pollution, Food, Soils, Atmospheric precipitation, Radiological dosage, Radiation monitors, Radiation measurement systems, Instrumentation, Sampling, Safety.

The report is a concise, comprehensive, and practical guide for planning, operating, and evaluating the effectiveness of a program for routine surveillance of radioactivity around nuclear facilities. Included are references to regulations and guides for evaluating releases from such facilities, and commentary on the nature and types of wastes to be anticipated; their fate when released to the environment; and recommended procedures for sampling the air, water, milk, food, biota, soil, and people for resulting contamination. (Author)

PB-189 756
Bechtel Corp., San Francisco, Calif.
BULK TRANSPORT OF WASTE SLURRIES TO INLAND AND OCEAN DISPOSAL SITES.
Summary rept.,
E. J. Wasp, T. L. Thompson, P. E. Snoek, J. P. Kenny, and J. C. Carney. Dec 69, 42p* W70-04004, FWPCA-DAST-16
Contract FWPCA-14-12-156
See also Volume 1, PB-189 757, Volume 2, PB-189 758 and Volume 3, PB-189 759.

Descriptors: (*Sewage, Disposal), Transportation, Pipes.
Identifiers: *Sludge disposal.

This is the summary report of a three volume study principally concerned with the development of regional land and ocean pipeline disposal systems for digested sewage sludge and maintenance dredgings.

PB-189 758
Bechtel Corp., San Francisco, Calif.
BULK TRANSPORT OF WASTE SLURRIES TO INLAND AND OCEAN DISPOSAL SITES. VOLUME II. CRITERIA FOR WASTE MANAGEMENT.
Water pollution control research series,
P. E. Snoek. Sep 69, 174p* W70-04006, FWPCA-DAST-16-Vol-2
Contract FWPCA-14-12-156
Also available as FWPCA-14010-EMS-09/69-Vol-2. See also Volume 1, PB-189 757, and Volume 3, PB-189 759.

Descriptors: (*Sewage, Disposal), Transportation, Pipes, Water pollution, Atlantic Ocean, Great Lakes.
Identifiers: *Sludge disposal.

Basic environmental criteria were studied for disposal of selected waste materials, including sewage treatment plant sludge, maintenance dredgings, power plant fly ash, and filter plant residues. Both land and ocean disposal alternatives were examined in terms of a general solution for 2 broad regions, namely the Great Lakes Megalopolis and Milwaukee to Buffalo and the Atlantic Coast Megalopolis from Boston to Norfolk. Present methods and costs of disposal have been included to complete the picture of the overall waste disposal problem. (WRSIC abstract)

PB-189 766
Federal Water Pollution Control Administration, Washington, D.C.
PROJECTS OF THE INDUSTRIAL POLLUTION CONTROL BRANCH.
Water pollution control research series,
William J. Lacy. Jan 70, 173p* W70-04045, FWPCA-DAST-38

Descriptors: (*Water pollution, *Wastes (Industrial)), (*Chemical industry, Water pollution), (*Paper industry, Water pollution), (*Petroleum industry, Water pollution), (*Textile industry, Water pollution), Abstracts, Scientific research.
Identifiers: *Metal industry, *Food industry, *Glass industry, *Industrial waste treatment.

The objective of the industrial pollution control R and D program was to develop and demonstrate the required technology to achieve required degrees of pollution control by lease cost methods for all significant industrial sources of pollution. This report includes summaries of 150 research, development, and demonstration efforts necessary to resolve industrial pollution problems. A total of 1200 program efforts are listed in tabular presentation. These projects include the latest developments in physical, chemical, biological, and combinations of treatment methods. It is expected to develop further the cooperation of industry to participate in meaningful pollution abatement demonstrations and to increasingly demonstrate the feasibility of in-plant measures, by-product recovery, and wastewater reuse as methods to abate pollution and to reduce treatment costs. Research through in-house efforts and by contracts to industries and universities are to complete state of the art studies related to treatment and control technology for selected industry groups. Industrial wastewaters are to be identified, characterized, quantitized, and classified for all industries of pollutional significance. (Author)

PB-189 774
Robert S. Kerr Water Research Center, Ada, Okla.
NUTRIENT REMOVAL FROM CANNERY WASTES BY SPRAY IRRIGATION OF GRASSLAND.
Water pollution control research series,
James P. Law. Nov 69, 84p W70-04062, FWPCA-16080-11/69

Descriptors: (*Water pollution, Control), (*Wastes (Industrial), Separation), Solids, Vegetables, Chemical reactions, Sprays, Soils, Nitrogen

compounds, Phosphorus compounds, Rainfall, Grasses, Hydrology.
Identifiers: *Waste water treatment, Cannery waste water, *Water conservation, Runoff.

The Campbell Soup Company plant at Paris, Texas, treats wastewater from the processing operations by spraying onto grassland. Vegetable solids and grease residues are separated and recovered. A comprehensive 12-month study was conducted to determine treatment efficiencies of the spray-runoff treatment system. A total of 133 inches of wastewater was applied to four experimental areas during the study period. Hydrological measurements, chemical removal efficiencies, and changes in soil properties were evaluated in relation to years of wastewater application, soil type, and spray schedule. Hydrological measurements accounted for 93 percent of the total liquid applied and showed that evaporative losses accounted for 18 percent of the total liquid applied; runoff accounted for 61 percent. During periods of heavy rainfall, runoff increased to a maximum of 80 percent of the total applied liquid. The results showed that the system achieved mass removals of 92 to 99 percent of the volatile solids and oxygen-demanding substances, 86 to 93 percent of total nitrogen, and 50 to 65 percent of phosphorus. Soil textural class and system age had very little effect on treatment efficiencies. Evaluation of surface and subsoil samples and soil water at the 3-foot depth indicated an increase in salinity with age, but nitrogen and phosphorus remained low. Much of the phosphorus removed from the wastewater was found in the surface soil layer. (Author)

PB-189 775
Rhodes Technology Corp., Houston, Tex.
DISSOLVED-AIR FLOTATION TREATMENT OF COMBINED SEWER OVERFLOWS.
Water pollution control research series.

Jan 70, 244p* W70-04063, PHS-Pub-999-WP-20-17
Contract FWPCA-14-12-11

Descriptors: (*Wastes (Sanitary engineering), Processing), (*Floods, Wastes (Sanitary engineering)), Flotation, Sewage, Costs, Air, Pilot plants.
Identifiers: *Overflows, *Sewage treatment.

A dissolved-air flotation system was evaluated for primary treatment of combined sewer overflows. The major pieces of component equipment were a gyratory screen, hydrocyclones, an air dissolving tank, and a flotation cell. The principal aspects investigated were: (1) Performance of the system during rain events and dry periods; (2) Evaluation of individual components; (3) Capital costs and operating costs for utilizing a flotation system for various size combined sewage overflows; (4) The adaptability of the system for automation and use in remote location; and (5) The ability of the system to treat intermittent and highly variable flows from combined sewage systems. Some chemical aids to flocculation were also tested. The system performed comparably to conventional clarifiers. It appears dissolved-air flotation systems would be economical for handling combined sewer overflows up to 8 MGD. Automation of dissolved-air flotation systems appears possible with conventional control equipment. Chemical aids to flocculation appear to have promise that warrants further study. The system was unique in that all liquid flow passed directly through the air dissolving tank with no recycle. Domestic sewage was studied in lieu of combined sewage during periods of no rain. (Author)

PB-189 896
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
X-RAY EMISSION FROM COLD-CATHODE GAS DISCHARGE TUBES USED FOR EDUCATIONAL PURPOSES,
William S. Properzio, Ray C. Woodcock, and Sidney D. Heidersdorf. Feb 70, 46p* DEP-70-1

Descriptors: (*Training devices, X-ray tubes), (*X-ray tubes, *Radiation hazards), Gas discharges, X rays, Radiation measurement systems.
Identifiers: Cold cathode X ray tubes.

The report describes a study to identify cold-cathode gas discharge devices used for educational purposes that may emit X-radiation. In addition to cold-cathode X-ray tubes, a number of other gas discharge devices were found to emit X-rays. A summary of laboratory measurements of the X-ray outputs from these tubes is presented. Recommendations are given regarding use of the tubes, based on these experimental data. Specific comments are directed to the science teacher utilizing the equipment, the distributor, and State or local radiological health agencies. (Author)

PB-189 953
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
COST AND PERFORMANCE ESTIMATES FOR TERTIARY WASTEWATER TREATING PROCESSES,
Robert Smith, and Walter F. McMichael. Jun 69, 32p* TWRC-AWTRL-9 W70-04298, FWPCA-17090-06/69

Descriptors: (*Wastes (Sanitary engineering), Processing), (*Water pollution, *Sewage), Costs, Limestone, Filters (Fluid), Carbon, Ammonia, Design.
Identifiers: *Activated sludge process, *Sewage treatment, Waste water, *Tertiary water treatment, Activated carbon treatment, Strippers, Dissolved organic matter, *Sewage filtration.

Generalized estimates of both performance and cost are presented for wastewater treatment processes which can be used with activated sludge process to reduce the pollution load on the receiving stream. Processes and groups of processes believed to be leading candidates for use downstream of secondary treatment are listed. Data from various sources on the fraction of 5-day BOD associated with suspended solids are tabulated. Microscreening or rapid sand filtration removes about 42% of the 5-day BOD and 21% of the COD and TOC. Other solids-removing processes, such as lime clarification, multimedia filtration, and granular carbon adsorption, remove a greater fraction of the suspended solids. Some of the dissolved organic contaminants might be removed, but this appears to be negligible. A large fraction of the dissolved organic species is removed by granular carbon adsorption. Estimates of the concentrations of BOD, COD, TOC, nitrogen, and phosphorus downstream of each group of processes are tabulated. Estimated capital and operating and maintenance costs for each process are shown. (WRSIC abstract)

PB-189 955
MSA Research Corp., Evans City, Pa.
LABORATORY INVESTIGATION OF THE REGENERATION OF SPENT GRANULAR ACTIVATED CARBON,
A. J. Juhola, and F. Tepper. Feb 69, 100p* W70-04297, FWPCA-17020-02/69
Contract FWPCA 14-12-107
Also available as TWRC-AWTRL-7

Descriptors: (*Wastes (Sanitary engineering), *Carbon), Furnaces, Heating.
Identifiers: *Tertiary water treatment, *Activated carbon treatment, *Sewage treatment, Regeneration (Engineering).

The regeneration of spent granular activated carbon, used in tertiary treatment of municipal waste water, is a three-step process, (1) drying, (2) baking and (3) activating. Laboratory studies with an indirect heated rotary tube furnace demonstrated that the rates at which the drying and baking steps are performed do not have a significant effect on the properties of the baked carbon. The controlling step for the regeneration product is the activation, and the important parameters are the carbon temperature, length of activating time, and steam or carbon dioxide concentration in the activating gas mixture. In multiple hearth furnace regenerations, where the reported carbon losses are 5% to 7% per regeneration, the characteristics of the activating step are: (1) high activating gas input rate, (2) relative short activating time, and (3) relatively low carbon temperature. Thermodynamic calculations made on the hearth furnace regeneration indicate that, by performing only the activation of a previously baked carbon, the hearth furnace gas input rate can be reduced drastically and to the point where it approaches the optimum rate of the rotary tube. (WRSIC abstract)

PB-190 110
Bureau of Radiological Health, Rockville, Md. Div. of Biological Effects.
RADIATION BIO-EFFECTS.
Summary rept. Jan-Dec 69,
William A. Mills. 1970, 240p DBE-70-1

Descriptors: (*Radiation effects, Reports), X rays, Dosage, Exposure, Microwaves, Cells (Biology), Radiobiology, Medical research, Radioactive isotopes.

This report summarizes the activities of the Division of Biological Effects during 1969. The investigations of Epidemiologic Studies Branch and the Experimental Studies Branch which comprise the Division are discussed. Titles of papers that Division investigators have prepared for presentation and those appearing in print during the year are listed. (Author)

PB-190 167
Swindell-Dressler Co., Pittsburgh, Pa.
APPRAISAL OF GRANULAR CARBON CONTACTING. PHASE III. ENGINEERING DESIGN AND COST ESTIMATE OF GRANULAR CARBON TERTIARY WASTE WATER TREATMENT PLANT,
A. E. Cover, and C. D. Wood. May 69, 54p W70-04549, FWPCA-17020-05/69-3
Contract DI-14-12-105
Prepared in cooperation with Robert A. Taft Water Research Center, Cincinnati, Ohio, Advanced Waste Treatment Research Lab., Rept. no. TWRC-AWTRL-12. See also Phases 1 and 2, PB-190 168.

Descriptors: (*Sewage, *Carbon), Costs, Operation, Design.
Identifiers: *Activated carbon treatment, *Tertiary water treatment.

The engineering design and cost estimate of a 10 million-gallon-per-day plant for tertiary treatment of waste water with granular activated carbon contains the process description, design bases, plant operation, control rationale, equipment list, equipment specifications and cost estimate. This design incorporates reliability, economy and current state-of-the-art technology. Although not fully proven in practice, it is based upon the application of mature engineering judgement to available data and offers economies over any other plant which has been successfully demonstrated. (WRSIC abstract)

PB-190 168
Swindell-Dressler Co., Pittsburgh, Pa.
APPRAISAL OF GRANULAR CARBON CONTACTING. PHASE I. EVALUATION OF THE LITERATURE ON THE USE OF GRANULAR CARBON FOR TERTIARY WASTE WATER TREATMENT. PHASE II. ECONOMIC EFFECT OF DESIGN VARIABLES,
A. E. Cover, and L. J. Pieroni. May 69, 115p* W70-04548, FWPCA-17020-05/69-1/2
Contract DI-14-12-105

Prepared in cooperation with Robert A. Taft Water Research Center, Cincinnati, Ohio, Advanced Waste Treatment Research Lab., Rept. no. TWRC-AWTRL-11. See also Phase 3, PB-190 167.

Descriptors: (*Sewage, *Carbon), Reviews, Economics, Adsorption, Reclamation, Particle size.
Identifiers: *Tertiary water treatment, *Activated carbon treatment, *Chemical oxygen demand, *Sewage treatment.

A literature review of tertiary waste water treatment gives special attention to activated carbon adsorption of chemical oxygen demand (COD), allowable capacity (loading) of carbon with organic waste matter, carbon particle size, and number of regeneration cycles on adsorption capacity and rate. The economic effects of shop fabrication and field erection of vessels, surge designs, plant size, idle carbon inventory, velocity, contact time, particle size, regeneration loss, carbon capacity, material costs, number of contacting stages, and in-place regeneration are discussed. Most of the data were collected from carbon treatment plants at Pomona (California), Lake Tahoe (California), Nitro (West Virginia), Washington (New Jersey), and Lebanon (Ohio). Recommendations are made for further evaluation and experimental work. (WRSIC abstract)

PB-190 169
IIT Research Inst., Chicago.
PHOTOLYSIS MECHANISMS FOR POLLUTION ABATEMENT,
Layton C. Kinney, and Victor R. Ivanuski. Oct 69, 53p* W70-04546, FWPCA-17050-10/69
Contract DI-14-12-475
Prepared in cooperation with Robert A Taft Water Research Center, Cincinnati, Ohio, Advanced Waste Treatment Research Lab., Rept. no. TWRC-AWTRL-13.

Descriptors: (*Sewage, *Photolysis), (*Water pollution, Photolysis), (*Wastes (Industrial), Photolysis), Catalysts, Oxidation, Titanium compounds, Zinc compounds, Dioxides, Phenols, Benzoic acids.
Identifiers: *Sewage treatment, Zinc oxides, *Dissolved organic matter, *Waste water treatment.

Photocatalytic oxidation of dissolved organic matter by irradiation of slurries of zinc titanate, zinc oxide, titanium dioxide, and beach sand was studied using sunlamps. The reaction appears to follow first order kinetics in most cases. Zinc oxide appears to be a superior catalyst for this purpose. Photocatalysts are widely distributed in nature, and photolytic oxidation is a mechanism whereby dissolved organic matter is oxidized in the natural environments of streams and lakes. Photolytic oxidation reduced the dissolved organic matter in a sample of domestic sewage by 50% and 75% during 24 hours and 70 hours, respectively. The limiting factor appears to be the activity of the photocatalyst. The most promising area of photolysis application will be in problems of industrial disposal where the concentrations of organic matter are high. (WRSIC abstract)

PB-190 170
General American Transportation Corp., Niles, Ill. General American Research Div.
MATHEMATICAL MODEL OF TERTIARY TREATMENT BY LIME ADDITION,
L. Seidel, and K. Patel. Sep 69, 80p* W70-04547, FWPCA-17010-09/69
Contract DI-14-12-416
Prepared in cooperation with Robert A. Taft Water Research Center, Cincinnati, Ohio, Advanced Waste Treatment Research Lab., Rept. no. TWRC-AWTRL-14.

Descriptors: (*Water pollution, *Phosphorus compounds), (*Calcium oxides, *Sewage), (*Wastes (Industrial), Calcium oxides), (*Phosphates, Water pollution), Costs, pH, Chemical precipitation, Mathematical models, Computer programs.
Identifiers: *Secondary water treatment, *Sewage treatment, *Waste water treatment.

The status of phosphorus removal from secondary effluents by lime addition is presented. Based on the empirical information available, a mathematical model of the process was developed. The factor which best correlated with phosphorus removal was the pH of the tertiary effluent. Cost information for the model was generated based on a solids-contact type precipitator such as the Infilco Densator. A computer program, in FORTRAN IV, derived from the model, was developed for use as a subroutine in the FWPCA Executive Calling Program. Given the input stream flow rate and analyses, and the final pH, the program computes the necessary does of lime and coagulant, their costs, the size and cost of the equipment, the degree of phosphorus removal, and the output stream analyses. (WRSIC abstract)

PB-190 171
Federal Water Pollution Control Administration, Edison, N.J. Water Quality Lab.
OIL SAMPLING TECHNIQUES.
Water pollution control research series.

Dec 69, 62p FWPCA-DAST-12 W70-04654, FWPCA-15080-FHT-12/69

Descriptors: (*Samplers, *Water pollution), (*Petroleum, Water pollution), (*Adsorption, *Oils), Foams, Films, Hydrocarbons.
Identifiers: *Oil pollution, *Oil slicks, *Crude oil.

Sampling of oil in the environment, depending upon the thickness of the slick, can present certain operational problems, most paramount of which is the collection of an adequate volume of sample required for identification by chemical analyses. Several basic 'dip-stick' techniques, which are primarily applicable for sampling slicks with a thickness of greater than 2 mm, as well as suggested methods for sampling thin oil slicks are discussed and illustrated. Included in this report are preliminary results on oil entrapment by solid absorbents. Also reported are results of investigations performed by foreign and U.S. scientists, using various types of sampling equipment and materials. (Author)

PB-190 193
MELPAR, Falls Church, Va.
OIL TAGGING SYSTEM STUDY, SUMMARY.
Water pollution control research series.

Oct 69, 37p* W70-04655, FWPCA-15080-DJQ-10/69
Contract DI-14-12-500
Also includes Rept. no. FWPCA-DAST-11.

Descriptors: (*Water pollution, Oils), (*Oils, Identification), Tracer studies, Chromatographic analysis, Halogenated hydrocarbons, Tankers, Cargo ships, Pipes, Costs.
Identifiers: *Oil tagging, *Oil pollution, Oil wastes.

Several methods of identifying the source of oil pollution are critically examined. These methods are grouped into two categories: passive tagging and active tagging. Passive tagging assumes that oils are so chemically diverse that their contents constitute a stable chemical fingerprint that can be unequivocally disclosed in the laboratory. Active tagging requires that an inexpensive, coded material be added to oil; this material must be chemically and physically stable in both oil and oil slicks; it must also be readily identifiable by available analytical techniques; and it must have no adverse effect on the oil's subsequent use. Three methods of passive tagging (trace metals, sulfur-isotope ratios, and paper chromatography) and three methods of active tagging (halogenated polycyclic aromatics, organometallics, and coded microspheroids) have been examined. (Author)

PB-190 197
Sacramento State Coll., Calif. Dept. of Civil Engineering.
COMPLEMENTARY-COMPETITIVE ASPECTS OF WATER STORAGE.
Water pollution control research series,
Kenneth D. Kerri. Dec 69, 194p W70-04653, FWPCA-16090-DEA-12/69
Also available as FWPCA-DAST-1.

Descriptors: (*Water supplies, Storage), (*Dams, Operation), (*Water pollution, Control), Mathematical models, Simulation, Programming (Computers), Economics, Recreation, Fluid flow, Temperature, Hydrology, Volume, Rivers, Management planning, Drainage, Floods, Damage, Evaporation.
Identifiers: *Water storage, Water resources.

Allocation of scarce water for flow augmentation to enhance water quality and other beneficial uses conflicts with other water demands. An analytical model is proposed that is capable of allocating water to competing demands on the basis of economic efficiency. The value of water is determined from the slopes of the benefit functions for water uses and an algorithm, based on the theory of marginal analysis, allocates water after considering the complementary and competitive uses of available water. Operations strategies may be selected and revised throughout the demand period regarding the amount of water to remain in storage, or stored and then released for downstream uses or downstream diversions. Results predict the frequency and magnitude of shortages for each beneficial use of water. Simulation of the hydrologic and economic systems of the proposed Holley Reservoir in the Willamette Valley in Oregon was used to test the effectiveness of the proposed analytical model and the results appear very good. A daily streamflow model and a relationship between reservoir operation and recreational attendance were developed to produce an accurate simulation of the basin. (WRSIC abstract)

PB-190 235
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
ATMOSPHERIC EMISSIONS FROM SULFURIC ACID MANUFACTURING PROCESSES.
Environmental health series: Air pollution,
Stanley T. Cuffe, and Carlton M. Dean. 1965, 136p PHS-Pub-999-AP-13
Cooperative Study Project. Prepared in cooperation with Manufacturing Chemists' Association, Inc., Washington, D.C. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.60 as FS 2.300:AP-13.

Descriptors: (*Air pollution, *Wastes (Industrial)), (*Sulfuric acid, Manufacturing methods), (*Waste gases, Sulfuric acid), (*Nitrogen oxides, Waste gases), Sulfur compounds, Dioxides, Costs, Economics, Chemical analysis, Sampling, Samplers, Adsorption.
Identifiers: *Sulfur dioxide, *Air pollution control equipment, *Nitrogen dioxide, Concentrators.

The report has been prepared to provide reliable information on atmospheric emissions from sulfuric acid manufacturing plants and on method and equipment normally employed to limit these emissions to satisfactory levels. Background information is included to define the importance of the sulfuric acid industry in the United States. Basic characteristics of the industry are discussed, including growth rate in recent years, types of raw materials used, end uses for the product, and the number of producing establishments, i.e. manufacturing sites, in existence during the past and at the present time. Process descriptions are given for the two processes in commercial use: the contact process and the chamber process. Process information includes discussions of the normal process variables that affect the types and quantities of emissions, the normal range of emissions, startup and shutdown losses, and methods of emission

control and recovery. Supplemental material provides detailed descriptions of sampling and analytical methods. Emissions to the atmosphere from a sulfuric acid plant depend upon a number of factors, such as design of the plant, skill of operation, efficiency of the catalyst, completeness of recovery operations, and the use of special devices to reduce emissions.

PB-190 236
National Center for Air Pollution Control, Cincinnati, Ohio.
ATMOSPHERIC EMISSIONS FROM THE MANUFACTURE OF PORTLAND CEMENT.
Environmental health series: air pollution,
Thomas E. Kreichelt, Douglas A. Kemnitz, and Stanley T. Cuffe. 1967, 53p* PHS-Pub-999-AP-17

Descriptors: (*Air pollution, Industrial plants), (*Cements, Industrial production), Reviews, Manufacturing methods, Industrial equipment, Materials, Industries, Control.
Identifiers: Portland cements.

The report summarizes published and unpublished information on actual and potential atmospheric emissions resulting from the manufacture of cement. Raw materials, process equipment, and production processes are described, as well as the location of plants, and process trends. Emission and related operating data are presented, along with methods normally employed to limit or control emissions from the dry, semi-dry, and wet processes. (Author)

PB-190 237
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
EFFECTS OF THE RATIO OF HYDROCARBON TO OXIDES OF NITROGEN IN IRRADIATED AUTO EXHAUST.
Environmental health series: Air pollution,
Merrill W. Korth. Oct 66, 65p PHS-Pub-999-AP-20

Descriptors: (*Air pollution, *Exhaust gases), (*Passenger vehicles, Exhaust gases), (*Photochemistry, Air pollution), (*Nitrogen oxides, Exhaust gases), (*Hydrocarbons, Exhaust gases), (*Plants (Botany), Air pollution), Eye, Irritating agents, Aldehydes.
Identifiers: *Automobile exhausts, Eye injuries, *Smog, Photochemical reactions, *Nitrogen dioxide, *Nitrogen oxide (NO).

As a part of a series of investigations of the problem of vehicle exhaust as an air pollutant, photochemical reactions are being studied in detail by the use of large dynamic irradiation chambers. In these studies auto exhaust, generated by test vehicles on a dynamometer, is diluted with air and irradiated to simulate the effects of sunlight under mixing conditions similar to those in the atmosphere. The irradiated mixture is used to study chemical reactions and to evaluate plant damage and human eye irritation. In this second series of irradiation tests, the ratio of total hydrocarbon (HC) to oxides of nitrogen (NOx) was varied between 1-1/2 and 24. Hydrocarbon concentrations were varied from 3 ppm to 12 ppm total carbon; oxides of nitrogen concentrations were varied from 1/4 ppm to 2 ppm. Greatest plant damage occurred when both the HC/NOx ratios and hydrocarbon concentrations were high. The levels of eye irritation were highest at the higher chamber hydrocarbon concentrations. For a given hydrocarbon level, chemical reaction rates were highest at the high HC/NOx ratios. (Author)

PB-190 238
National Center for Air Pollution Control, Cincinnati, Ohio.
SEMINAR ON HUMAN BIOMETEOROLOGY.
Environmental health series: air pollution.

1967, 187P PHS-PUB-999-AP-25

Descriptors: (*Air pollution, Symposia), (*Micrometeorology, Air pollution), Hypoxia, High altitude, Climatology, Meteorology, Mortality rates, Physiology, Measurement, Ecology, Environment, Public health.
Identifiers: *Biometeorology.

The volume is a collection of papers presented at Cincinnati, Ohio, Jan. 14-17, 1964, at a seminar on human biometeorology. Topics discussed included physiological and climatological instrumentation, climates of the United States, altitude, microclimatology, indoor and outdoor weather, ultraviolet light, heat exposure, air ions, and cold stress. (Author)

PB-190 239
National Center for Air Pollution Control, Cincinnati, Ohio.
ATMOSPHERIC EMISSIONS FROM NITRIC ACID MANUFACTURING PROCESSES.
Environmental health series: air pollution.

1966, 96P PHS-Pub-999-AP-27
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20425, $0.40.

Descriptors: (*Air pollution, *Wastes (Industrial)), (*Nitric acid, *Manufacturing methods), (*Waste gases, Nitrogen oxides), (*Nitrogen oxides, Air pollution), Sampling, Chemical analysis, Nitrates, Adsorption.
Identifiers: *Nitrogen dioxide, *Nitrogen oxide (NO), *Air pollution control equipment, Scrubbers.

Emissions to the atmosphere from the manufacture of nitric acid were investigated jointly by the Manufacturing Chemists' Association, Inc. and the U. S. Public Health Service; the study was the second in a cooperative program for evaluation of emissions from selected chemical manufacturing processes. The report describes the growth and potential of the nitric acid industry, the principal processes for production of nitric acid, process variables, emissions from plants under normal operating conditions, and the methods and devices used to limit and control emissions. The sampling and analytical techniques by which emissions were assessed are presented in detail. (Author)

PB-190 240
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RAPID SURVEY TECHNIQUE FOR ESTIMATING COMMUNITY AIR POLLUTION EMISSIONS,
Guntis Ozolins, and Raymond Smith. Oct 66, 81p PHS-Pub-999-AP-29

Descriptors: (*Air pollution, Analysis), Data, Emissivity, Sources, Inventory, Sampling, Urban areas, Monitors, Geography, Distribution.

A method is presented for estimating rapidly the major emissions of air pollutants in a community. The method is based on information that is readily available in most urban areas; it does not entail extensive surveys or sampling procedures. Application of this survey method will yield a series of tables, maps, and diagrams that indicate (1) the weights of emissions of selected pollutants, by year and by season; (2) the relative importance of various fuels and types of sources in producing the emissions; (3) the relative amounts of pollutants emitted in various geographic sub-areas of the community. Such information constitutes a useful tool for developing an air conservation program. (Author)

PB-190 241
National Center for Air Pollution Control, Cincinnati, Ohio.
HEALTH ASPECTS OF CASTOR BEAN DUST: REVIEW AND BIBLIOGRAPHY.
Environmental health series: air pollution,
Edwin M. Apen, Jr., W. Clark Cooper, Robert J. M. Horton, and Lester D. Scheel. 1967, 135p PHS-Pub-999-AP-36

Descriptors: (*Air pollution, *Reviews), (*Plants (Botany), Toxicity), Dust, Wind, Transport properties, Public health, Allergy, Powders, Sensitivity, Control, Etiology, Bibliographies.
Identifiers: Plant residues, *Castor bean dust, Ricinus communis.

Castor pomace is the residue that remains after castor oil has been removed from the beans of the castor plant Ricinus communis. It is initially in flat cakes, which are broken up into a fine dry powder. This pomace contains one of the most potent allergens nown. It is, therefore, of considerable interest in occupational medicine. Severe allergic reactions frequently occur in exposed workers when appropriate safeguards are not employed. In addition, the fine, light powder form in which the pomace occurs is readily transported from factory and shipping areas into the surrounding community by winds. As a community air pollutant, the pomace can cause widespread and severe allergy in the neighborhoods of mills and factories where it is produced or handled. This publication reviews the occupational and air pollution aspects of castor pomace. An annotated bibliography and selected translations of foreign articles are also included. (Author)

PB-190 242
National Center for Air Pollution Control, Cincinnati, Ohio.
UNITED STATES METROPOLITAN MORTALITY 1959-1961.
Environmental health series: air pollution,
Edward A. Duffy, and Robert E. Carroll. 1967, 213p* PHS-Pub-999-AP-39

Descriptors: (*Mortality rates, United States), (*Urban areas, Mortality rates), Statistical data, Tables, Population, Sex, Aging (Physiology), Etiology, Life span.

This report has been prepared to help fill the need for more detailed information about recent variations in mortality among urban areas. Rates for selected causes have been computed for 201 standard metropolitan statistical areas from 1959-1961 mortality data supplied by the National Center for Health Statistics and population data from the 1960 Census of Population. (Author)

PB-190 243
National Center for Air Pollution Control, Cincinnati, Ohio.
AIR POLLUTION ENGINEERING MANUAL. AIR POLLUTION CONTROL DISTRICT COUNTY OF LOS ANGELES.
Environmental health series: air pollution,
John A. Danielson. 1967, 919p PHS-Pub-999-AP-40
Paper copy available from Superintendent of Documents, GPO, Washington, D.C., 20402, Price $5.75 as FS 2.300:AP-40.

Descriptors: (*Air pollution, Industries), (*Handbooks, Air pollution), Engineering, Incinerators, Gases, Aerosols, Exhaust systems, Filters (Fluid), Adsorption, Metallurgy, Combustion, Petroleum, Law, California.
Identifiers: *Air pollution control devices, Los Angeles (California).

The Air Pollution Engineering Manual deals with the control of air pollution at individual sources. This approach is unique because it emphasizes the practical engineering problems of design and operation associated with the many sources of air pollution. These sources reside in metallurgical, mechanical, incineration, combustion, petroleum, and chemical processes. The air pollution problems presented originate in industrial and commercial sources peculiar to the Los Angeles area. (Author)

PB-190 244
National Center for Air Pollution Control, Cincinnati, Ohio.
CALCULATING FUTURE CARBON MONOXIDE EMISSIONS AND CONCENTRATIONS FROM URBAN TRAFFIC DATA.
Environmental health series: air pollution,
Wayne Ott, John F. Clarke, and Guntis Ozolins.
Jun 67, 43p PHS-Pub-999-AP-41

Descriptors: (*Air pollution, *Carbon monoxide), (*Traffic, Air pollution), Concentration (Chemistry), Urban areas, Environment, Measurement, Statistical analysis, Vehicles, Public health.

The basic goal of this study was to test the feasibility of an urban area approach for calculating carbon monoxide emissions and concentrations from traffic data. That the method provided reasonable results and that the bulk of this report is devoted to a discussion of these results attests to the success of the approach. However, it should not be assumed that the approach is now ready to be applied to a variety of other cities; the authors caution that many of the steps in the approach and the underlying assumptions should best be further examined and refined. This report is intended not primarily as an end in itself but as a starting point for future efforts. (Author)

PB-190 245
National Air Pollution Control Administration, Raleigh, N.C.
COMPILATION OF AIR POLLUTANT EMISSION FACTORS.
Environmental health series: air pollution,
R. L. Duprey. 1968, 75p PHS-Pub-999-AP-42

Descriptors: (*Air pollution, *Wastes (Industrial)), (*Chemical industry, Air pollution), (*Food industry, Air pollution), (*Cements, Air pollution), (*Petroleum industry, Air pollution), (*Organic solvents, Air pollution), (*Transportation, Air pollution), Exhaust gases, Incinerators, Combustion products.
Identifiers: *Metal industry.

The report is a compilation of emission factors from various sources: Fuel combustion (Coal, gas, fuel oil); Refuse incineration; Chemical process industry (Ammonia, chlorine, nitric acid, paint and varnish, phosphoric acid, phthalic anhydride, sulfuric acid); Food and agricultural industry (Alfalfa dehydrating, coffee roasting, cotton ginning, feed and grain, fish meal, starch manufacturing); Metallurgical industry; Mineral products industry (Asphalt roofing, asphaltic concrete, calcium carbide, cement manufacturing, ceramic and clay processes, concrete batching, frit manufacturing, glass manufacturing, lime production, perlite manufacturing, rock wool manufacturing); Petroleum refinery; Pulp and paper industry; Solvent evaporation and gasoline marketing; Transportation (Aircraft, automobiles, and diesel engine vehicles).

PB-190 246
National Center for Air Pollution Control, Washington, D.C.
A COMPILATION OF SELECTED AIR POLLUTION EMISSION CONTROL REGULATIONS AND ORDINANCES,
Environmental health series: air pollution.

1968, 145P PHS-Pub-999-AP-43
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402, as FS 2.300:AP-43, $0.75.

Descriptors: (*Air pollution, Control), (*Law, Air pollution), Standards, Emissivity, Sources, Smokes, Fuels, Incinerators, Generators, Heating, Waste gases, Dust, Particles, Furnaces, Gases, Industries, Housing, Pennsylvania, Illinois, Ohio, Oregon, New York, Missouri, Michigan, Indiana, California, New Jersey, Florida, Vehicles, Odors.
Identifiers: Zoning.

Contents: Definitions Typically included in air pollution ordinances; Smoke emissions and equivalent opacity regulations; Particulate emissions from fuel-burning plants; Particulate emissions from refuse-burning equipment; Particulate emissions from manufacturing processes; Emissions from asphalt plants; Sulfur compound emission control; Organic solvent emission control; Hydrocarbon emission control; Fluoride emission control; Motor vehicle emission control; Odor emission control; Zoning ordinances.

PB-190 247
National Center for Air Pollution Control, Durham, N.C.
HANDBOOK OF AIR POLLUTION.
Environmental health series: air pollution,
James P. Sheehy, William C. Achinger, and Regina A. Simon. 1969, 231p* PHS-Pub-999-AP-44
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402, as FS 2.300:AP-44, $2.25.

Descriptors: (*Air pollution, *Handbooks), Data, Statistical data, Tables, Graphics, Physics, Gases, Air, Water vapor, Chemistry, Mathematics, Medicine, Dust, Smokes, Bibliographies.

Individuals working in the air pollution field often need access to data concerning the characteristics and behavior of air, gases and particles, and the chemistry of atmospheric pollutants, and to data of a general nature such as mathematics and common conversion factors. At present, to have access to all this information, the individual needs a wide variety of reference books. The Air Pollution Handbook was designed to consolidate the applicable portions of these numerous references into a single, easily accessible source. The primary consideration for inclusion in the handbook is that the information be unlikely to change. This, then, excludes experimental results and data on air quality, even though these may be quite useful. The one exception to this general rule is the section on medical aspects. The experimental data that is included here is widely accepted in the field of biological experimentation. (Author)

PB-190 248
National Air Pollution Control Administration, Durham, N.C.
THANKSGIVING 1966 AIR POLLUTION EPISODE IN THE EASTERN UNITED STATES,
Jack C. Fensterstock, and Robert K. Faukhauser.
Jul 68, 47p NAPCA-Pub-AP-45

Descriptors: (*Air pollution, Reviews), Connecticut, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, West Virginia, Tennessee, Alabama, District of Columbia, Air, Quality control, Sources, Humans, Diseases, Public health.
Identifiers: *Air pollution episode 1966.

This report has documented the Thanksgiving 1966 Air Pollution Episode in the Eastern United States in terms of the daily meteorology and ambient air quality. Analysis of the available air quality data indicates that the Air Pollution Potential Forecast Program (APPF) of the Public Health Service and the Weather Bureau did effectively forecast the stagnation. The increase in levels of the pollutants during the same period is indicative of stagnation regardless of the city considered. Advance warning is a necessary step to effective control. To effectively use APPF, municipalities must reduce emissions of air pollutants until meteorological conditions change to provide better ventilation for the affected areas. Monitoring and forecasting at local levels to augment the APPF is also needed. A period of restricted natural ventilation on November 17 covered a small area and was short in duration, precluding it from generating an air pollution potential advisory. However, air quality did deteriorate significantly during this period; pollutant levels recorded in some cities approximated peak concentrations during the subsequent episode. (Author)

PB-190 249
National Air Pollution Control Administration, Raleigh, N.C.
INTERIM GUIDE OF GOOD PRACTICE FOR INCINERATION AT FEDERAL FACILITIES.

Nov 69, 105p* NAPCA-Pub-AP-46

Descriptors: (*Air pollution, Incinerators), (*Incinerators, Standards), Construction, Garbage, Combustion products, Wastes (Sanitary engineering).
Identifiers: *Air pollution control equipment, *Solid waste disposal, Fly ash, Scrubbers, Burners.

The document is an interium guide for Federal agencies for the control of air pollution. The report is to help Federal agencies select incinerators for solid waste disposal.

PB-190 250
National Air Pollution Control Administration, Durham, N.C.
ATMOSPHERIC EMISSIONS FROM THERMAL-PROCESS PHOSPHORIC ACID MANUFACTURE.
Cooperative Study Project,
Don R. Goodwin, and Fred G. Rolater. Oct 68, 72p NAPCA-Pub-AP-48
Prepared in cooperation with Manufacturing Chemists' Association, Inc., Washington, D.C.
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.40 as FS 2.300:AP-48.

Descriptors: (*Air pollution, *Wastes (Industrial)), (*Phosphoric acids, Manufacturing methods), (*Waste gases, Phosphoric acids), Nitrogen oxides, Costs, Sampling.
Identifiers: Hydrogen sulfide, Scrubbers, *Air pollution control equipment.

The report has been prepared to provide information on phosphoric acid manufacture by the thermal process. This report does not include information on the manufacture of phosphoric acid by the wet process. Background information is included to define the importance of the thermal-process phosphoric acid industry in the United States. Basic characteristics of the industry are discussed, including growth rate in recent years, uses for the product, and the number and location of the producing sites. A process description is given for the thermal process. Process information includes discussion of normal process variables that affect the quantity of emissions, the normal range of emissions, and methods of controlling or reducing emissions. Supplemental material provides detailed emission sampling and analytical methods. Emissions to the atmosphere from a thermal-process phosphoric acid plant depend upon a number of factors, such as plant design, skill of operation, efficiency of hydration, and the type and operation of special devices to reduce emissions. (Author)

PB-190 251
National Air Pollution Control Administration, Washington, D.C.
AIR QUALITY CRITERIA FOR PARTICULATE MATTER.

Jan 69, 219p NAPCA-Pub-AP-49
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.75 as FS 2.300:AP-49.

Descriptors: (*Air pollution, Effectiveness), (*Particles, Air pollution), Sources, Emissivity, Meteorology, Plants (Botany), Particle size, Economics, Toxicity, Humans, Solar radiation, Respiratory system, Diseases, Quality control, Epidemiology, Materials.
Identifiers: *Air quality criteria.

Air quality criteria are an expression of the scientific knowledge of the relationship between vari-

ous concentrations of pollutants in the air and their adverse effects on man and his environment. They are issued to assist the States in developing air quality standards. Air quality criteria are descriptive; that is, they describe the effects that have been observed to occur when the ambient air level of a pollutant has reached or exceeded specific figures for a specific time period. In developing criteria, many factors have to be considered. The chemical and physical characteristics of the pollutants and the techniques available for measuring these characteristics must be considered, along with exposure time, relative humidity, and other conditions of the environment. The criteria must consider the contribution of all such variables to the effects of air pollution on human health, agriculture, materials, visibility, and climate. Further, the individual characteristics of the receptor must be taken into account. The particulate matter commonly found dispersed in the atmosphere is composed of a large variety of substances. Some of these--flourides, beryllium, lead, and asbestos, for example--are known to be directly toxic, although not necessarily at levels routinely found in the atmosphere today.

PB-190 252
National Ai Pollution Control Administration, Washington, D.C.
AIR QUALITY CRITERIA FOR SULFUR OXIDES.

Jan 69, 186p NAPCA-Pub-AP-50
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.50 as FS 2.300:AP-50.

Descriptors: (*Air pollution, *Sulfur compounds), (*Plants (Botany), Air pollution), (*Diseases, Air pollution), Reviews, Dioxides, Oxides, Chemical analysis, Respiratory diseases, Atmosphere.
Identifiers: *Sulfur dioxide, *Sulfur oxides.

The document focuses on the sulfur oxides commonly found in the atmosphere--sulfur dioxide, sulfur trioxide, their acids, and the salts of their acids. Further, the document considers the effects of the sulfur oxides in conjunction with other pollutant classes, especially particulate matter, where important synergistic effects are observed. The chemical and physical characteristics of the sulfur oxides are reviewed and the various analytical methods for measuring them in the atmosphere are considered. Aso discussed are the effects of the sulfur oxides on visibility, vegetation, and materials. The toxicological effects of sulfur oxides on animals and on man are considered in separate chapters. Finally, there is a discussion of epidemiological studies that assesses the dose-population response and the response of population subgroups (i.e., children, the elderly, respiratory cripples, etc.) to sulfur oxides and to sulfur dioxide in the presence of particulate matter. The literature has been generally reviewed through June 1968. (Author)

PB-190 253
National Air Pollution Control Administration, Washington, D.C.
CONTROL TECHNIQUES FOR PARTICULATE AIR POLLUTANTS.

Jan 69, 241p NAPCA-Pub-AP-51
Paper copy available from Superintendent of Documents, Washington, D.C. 20402. $1.75 as FS 2.300:AP-51.

Descriptors: (*Air pollution, Control), Particles, Sources, Industries, Internal combustion engines, Incinerators, Passenger vehicles, Bibliographies, Emissivity, Economics.

Particulate material found in ambient air originates from both stationary and mobile sources. Of the 11.5 million tons of particulate pollution produced by industrial, commercial, and domestic sources in 1966, 6 million tons were emitted from industrial sources, including industrial fuel burning; 5 million tons from power generation, incineration, and space heating; and 0.5 million ton from mobile sources. The following techniques are in use for controlling the source or reducing the effects of particulate pollution: Gas cleaning; Source relocation; Fuel substitution; Process changes; Good operating practice; Source shutdown; Dispersion.

PB-190 254
National Air Pollution Control Administration, Washington, D.C.
CONTROL TECHNIQUES FOR SULFUR OXIDE AIR POLLUTANTS.
Jan 69, 144p* NAPCA-Pub-AP-52
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25 as FS 2.300:AP-52.

Descriptors: (*Air pollution, *Sulfur compounds), (*Combustion products, Sulfur compounds), (*Coal, Air pollution), (*Petroleum, Air pollution), (*Wastes (Industrial), Sulfur compounds), Power plants (Establishments), Waste gases, Refineries, Refining (Metallurgy), Sulfuric acid, Chemical industry, Manufacturing methods, Costs, Limestone, Adsorption.
Identifiers: *Air pollution control equipment, Paper industry, *Sulfur dioxide, *Sulfur oxides, Kraft paper.

The document reports the major sources of sulfur oxide air pollution, and discusses the control techniques for fuel combustion processes, industrial processes, and dispersion from stacks as found in many industries.

PB-190 255
National Air Pollution Control Administration, Arlington, Va.
ST. LOUIS DISPERSION STUDY. VOLUME II. ANALYSIS,
James L. McElroy, and Francis Pooler, Jr. Dec 68, 56p NAPCA-Pub-AP-53

Descriptors: (*Atmospheric motion, Tracer studies), Diffusion, Particles, Fluorescence, Zinc compounds, Cadmium sulfides, Theodolites, Sampling, Mathematical analysis, Stability, Urban areas, Missouri, Air pollution.
Identifiers: Graphs (Charts), Eddies, St. Louis (Missouri).

The primary analyses performed on data collected during low-level tracer experiments conducted over metropolitan St. Louis, Missouri, are described. Values of dispersion parameters derived from the tracer data are related to readily derived or measured meteorological indices of turbulence. The results are graphically presented in terms of best-fit curves as functions of downwind distance and travel time. Comparisons are made with the results of previous diffusion experiments conducted over relatively uncomplicated terrain in open country. It is concluded that for low-level point sources the urban area affects cross-wind dispersion primarily by enhancing the initial size (i.e., close to the source) of the plume. (Author)

PB-190 256
National Air Pollution Control Administration, Durham, N.C.
ATMOSPHERIC EMISSIONS FROM HYDROCHLORIC ACID MANUFACTURING PROCESSES.
Cooperative Study Project,
Samuel L. Bean, and Howard Wall, Jr. Sep 69, 66p NAPCA-Pub-AP-54
Prepared in cooperation with Manufacturing Chemists' Association, Inc., Washington, D.C.
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.35 as FS 2.300:AP-54.

Descriptors: (*Hydrochloric acid, Manufacturing methods), (*Air pollution, *Wastes (Industrial)), (*Waste gases, Hydrochloric acid), Sampling, Costs, Economics, Chlorides, Halogenated hydrocarbons, Chlorine.
Identifiers: *Hydrogen chloride, Concentrators.

The report is one of a series on atmospheric emissions from chemical manufacturing processes. It provides such information on the manufacture of hydrochloric acid. Basic characteristics of the industry, including growth rate, manufacturing processes, product uses, and the number of producing plants in the United States are discussed. Process descriptions are given for the chlorinated by-product process and the synthesis process, which employs the direct combustion of hydrogen in chlorine. Process information includes the range of emissions of hydrogen chloride from hydrochloric acid manufacturing plants and the methods of limiting or controlling these emissions to the atmosphere. Although other contaminants such as chlorine, chlorinated organics, and other hydrocarbons emitted to the atmosphere from these plants are mentioned and in some cases discussed, they are not the primary concern of this report. Detailed descriptions of the sampling and analytical methods used to measuring such emissions are also included. (Author)

PB-190 257
National Air Pollution Control Administration, Cincinnati, Ohio.
TOBACCO, A SENSITIVE MONITOR FOR PHOTOCHEMICAL AIR POLLUTION,
Walter W. Heck, Frank L. Fox, C. Stafford Brandt, and John A. Dunning. Jun 69, 25p* NAPCA-Pub-AP-55
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402, as FS 2.300:AP-55, $0.25.

Descriptors: (*Air pollution, *Photochemistry), (*Tobacco, Air pollution), (*Plants (Botany), Air pollution), Monitors, Oxidizers, Fertilizers.
Identifiers: *Smog, Leaves (Botany), Plant growth.

The development of a technique by which the sensitive tobacco variety, Bel W3 is used as a monitor for photochemical air pollution is discussed. The technique uses the plant as an indicator of the oxidant complex in both urban and rural areas. Two pilot studies that were conducted over a 3-year period during the development of the monitoring technique are included in the discussion. Attention is given to an explanation of the proper procedures for planting, transplanting, fertilizing, and caring for mature plants. The methods used in determining and recording injury to plant leaves is included; the studies showed almost daily injury to monitoring plants. (Author)

PB-190 258
National Air Pollution Control Administration, Arlington, Va.
AIR POLLUTION TRANSLATIONS: A BIBLIOGRAPHY WITH ABSTRACTS. VOLUME 1.

May 69, 173p* NAPCA-Pub-AP-56
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.75 as FS 2.300:AP-56.

Descriptors: (*Air pollution, *Bibliographies), Abstracts, Measurement, Meteorology, Plants (Botany), Economics, Management planning, Law, Standards, Humans, Diseases, Effectiveness, Sources, Animals.

Contents: General; Emission sources; Atmospheric interaction; Measurement methods; Control methods; Effects - human health; Effects - plants and livestock; Effects - materials; Effects - economic; Air quality measurements; Legal and administrative aspects; Standards and criteria; Basic science and technology; Author index; Language index; Subject index.

PB-190 259
National Air Pollution Control Administration, Raleigh, N.C.
AIR POLLUTION ASPECTS OF BRASS AND BRONZE SMELTING AND REFINING INDUSTRY,
Stanley T. Cuffe, and Earl S. Schwartz. Nov 69, 65p NAPCA-Pub-AP-58
Prepared in cooperation with Brass and Bronze Ingot Inst., Chicago, Ill. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402 as FS 2.3000:AP-58, $0.35.

Descriptors: (*Air pollution, *Refining (Metallurgy)), (*Brass, Refining (Metallurgy)), (*Bronze, Refining (Metallurgy)), Industries, State-of-the-art reviews, Manufacturing methods, Control.

The report covers: Manufacturing processes; Emissions from brass and bronze production; Control of emissions; Emission guidelines.

PB-190 260
National Air Pollution Control Administration, Raleigh, N.C.
THE CLIMATE OF CITIES: A SURVEY OF RECENT LITERATURE,
James T. Peterson. Oct 69, 53p NAPCA-Pub-AP-59
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402 as FS 2.300:AP-59, $0.55

Descriptors: (*Urban areas, Climatology), (*Climatology, *Reviews), Atmospheric precipitation, Humidity, Atmospheric temperature, Visibility, Solar radiation, Wind, Visibility, Air pollution.
Identifiers: *Urban climate.

The climate of a city differs from that of the rural areas surrounding it, and an increasing amount of scientific research is devoted to comparative studies of urban and rural climates. This report is a survey of the literature on city climatology, with emphasis on that written since the series of articles published by Dr. H. Landsberg, from 1956 to 1962. Those meteorological aspects of urban climate that have been most frequently investigated are discussed herein; they are temperature, humidity, visibility, radiation, wind, and precipitation. (Author)

PB-190 261
National Air Pollution Control Administration, Washington, D.C.
AIR QUALITY CRITERIA FOR CARBON MONOXIDE.

Mar 70, 179p* NAPCA-Pub-AP-62
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.50 as FS 2.300:AP-62, See also PB-190 263.

Descriptors: (*Air pollution, *Carbon monoxide), (*Atmosphere, Carbon monoxide), (*Diseases, Carbon monoxide), (*Plants (Botany), Carbon monoxide), (*Exhaust gases, Carbon monoxide), Toxicity, Epidemiology, Chemical reactions, Adsorption, Oceans, Combustion products, Sampling, Hemoglobin, Central nervous system.
Identifiers: *Automobile exhausts.

The document focuses on carbon monoxide (CO) as it is found in the ambient air; therefore, literature on extremely high levels of CO has not been extensively cited. The occurrence, properties, and fate of atmospheric CO and principles of formation and control are reviewed followed by a discussion of estimation of CO emissions and measurement of atmospheric CO. The effects of CO are considered in relation to (1) vegetation, (2) toxicological studies on animals and man, and (3) epidemiological studies. The scientific literature has been generally reviewed through March 1969, with additional sources from reports as recent as January 1970. The literature has been reviewed thoroughly for information related to the development of criteria; and the document not only summarizes the current scientific knowledge of CO air pollution, but also attempts to point up the major deficiencies in that knowledge and the presently recognized needs for further research. (Author)

PB-190 262
National Air Pollution Control Administration, Washington, D.C.
AIR QUALITY CRITERIA FOR PHOTOCHEMICAL OXIDANTS.

Mar 70, 202p* NAPCA-Pub-AP-63
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.75 as FS 2.300:AP-63.

Descriptors: (*Air pollution, *Photochemistry), (*Ozone, Air pollution), (*Nitrogen oxides, Air pollution), (*Atmosphere, Air pollution), (*Plants (Botany), Air pollution), (*Diseases, Air pollution), Textiles, Nitrates, Peroxides, Meteorology, Toxicity, Sampling, Chemical analysis, Urban areas, Epidemiology.
Identifiers: *Peroxyacetyl nitrate, *Photochemical reactions, *Nitrogen oxide (NO), *Smog, *Nitrogen dioxide, Eye injuries.

The document focuses on photochemical oxidants as they are found in the ambient air. In general, discussions are oriented towards the physical and chemical nature of these oxidants, atmospheric concentrations and measurement of these oxidants, and possible natural sources of ozone. The presence of photochemical oxidants in the ambient air is then considered in relation to (1) effects on vegetation, (2) effects on materials, (3) toxicological studies of effects on animals and man, and (4) epidemiological studies. The scientific literature has been reviewed through January 1969, with additional sources from publications as recent as November 1969. The results and conclusions of foreign investigations have been evaluated for their possible application to the air pollution problem in the United States. The literature has been reviewed thoroughly for information related to the development of criteria, and the document not only summarizes the current scientific knowledge of photochemical air pollution, but also attempts to point up the major deficiencies in that knowledge and the presently recognized needs for further research. (Author)

PB-190 263
National Air Pollution Control Administration, Washington, D.C.
CONTROL TECHNIQUES FOR CARBON MONOXIDE EMISSIONS FROM STATIONARY SOURCES.

Mar 70, 72p* NAPCA-Pub-AP-65
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.70 as FS 2.300:AP-65, See also PB-190 261.

Descriptors: (*Air pollution, *Carbon monoxide), (*Iron industry, Air pollution), (*Chemical industry, Air pollution), (*Combustion products, Carbon monoxide), (*Wastes (Industrial), Air pollution), (*Petroleum industry, Air pollution), Steel, Carbon black, Ammonia, Phosgene, Carboxylic acids, Aldehydes, Costs, Carbides, Incinerators, Coal, Petroleum.
Identifiers: *Air pollution control equipment, *Paper industry, Kraft paper.

The document has been prepared to summarize current information on sources of carbon monoxide (CO) emissions, methods of control, and costs and cost-effectiveness of controls. The control techniques described herein represent a broad spectrum of information from many engineering and other technical fields. The devices, methods, and principles have been developed and used over many years, and much experience has been gained in their application. They are recommended as the techniques generally applicable to the broad range of CO emission control problems. Many agricultural, commercial, industrial, and municipal processes and activities that generate CO are described individually in this document. Various techniques that can be applied to control emissions of CO from these sources are reviewed and compared, and equipment costs are included, also. Although exhaust from automobiles constitutes by far the greatest source of CO in the atmosphere, this emission category is not discussed comprehensively in this document. (Author)

PB-190 264
National Air Pollution Control Administration, Washington, D.C.
CONTROL TECHNIQUES FOR CARBON MONOXIDE, NITROGEN OXIDE, AND HYDROCARBON EMISSIONS FROM MOBILE SOURCES.

Mar 70, 132p* NAPCA-Pub-AP-66
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25 as FS 2.300:AP-66.

Descriptors: (*Air pollution, *Passenger vehicles), (*Exhaust gases, Air pollution), (*Hydrocarbons, Air pollution), (*Nitrogen oxides, Air pollution), (*Carbon monoxide, Air pollution), Combustion products, External combustion engines, Electric motors, Costs, Internal combustion engines, Fuel cells.
Identifiers: *Automobile exhausts, *Diesel engine exhausts, *Air pollution control equipment, Stirling cycle engines.

The predominant source of carbon monoxide (CO), nitrogen oxide (NOx), and hydrocarbon (HC) from mobile combustion sources is the exhaust gas from gasoline-fueled engines. The principal mobile sources that generate CO, NOx, and HC emissions are described individually. Various techniques to control such emissions from these sources are reviewed. Technical considerations of the more prominent and feasible design modifications, alternative power sources, fuel modifications, auxiliary devices, and alternative transportation modes are presented. Sections on source evaluation, equipment costs, cost effectiveness analysis, and current research and development also are included. Pertinent references are presented at the end of each section. (Author)

PB-190 265
National Air Pollution Control Administration, Washington, D.C.
CONTROL TECHNIQUES FOR NITROGEN OXIDE EMISSIONS FROM STATIONARY SOURCES.

Mar 70, 115p* NAPCA-Pub-AP-67
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.00 as FS 2.300:AP-67.

Descriptors: (*Air pollution, *Nitrogen oxides), (*Waste gases, Nitrogen oxides), (*Exhaust gases, Nitrogen oxides), (*Combustion products, Nitrogen oxides), Photochemistry, Adsorption, Wastes (Industrial), Reduction (Chemistry), Catalysts, Iron industry, Petroleum industry, Nitric acid, Nitrates, Incinerators.
Identifiers: *Automobile exhausts, *Nitrogen oxide (NO), *Nitrogen dioxide, *Smog, *Photochemical reactions, *Air pollution control equipment, Scrubbers.

The document reviews the role of nitrogen oxides in air pollution. A discussion is presented on combustion control techniques to remove nitrogen oxides from exhaust gases. Also reported are the various methods to remove nitrogen oxides from industrial waste gases.

PB-190 266
National Air Pollution Control Administration, Washington, D.C.

CONTROL TECHNIQUES FOR HYDROCARBON AND ORGANIC SOLVENT EMISSIONS FROM STATIONARY SOURCES.

Mar 70, 114p* NAPCA-Pub-AP-68
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.00 as FS 2.300:AP-68.

Descriptors: (*Air pollution, *Hydrocarbons), (*Organic solvents, Air pollution), (*Waste gases, Hydrocarbons), Incinerators, Refineries, Chemical industry, Coal, Rubber, Plastics industry, Varnishes, Wastes (Sanitary engineering), Wastes (Industrial), Photochemistry, Iron industry, Costs.
Identifiers: *Air pollution control equipment, Food processing, Dry cleaning.

The effects of hydrocarbon and organic solvent emissions are of two types, direct and indirect. Direct effects are caused by the original, unaltered emissions, and indirect effects are caused by substances formed by photochemical reactions of the original emissions with other substances in the atmosphere. The purpose of the document is to make information available on techniques for the control of organic emissions from stationary sources. Sources of hydrocarbon emissions include petroleum refining, gasoline distribution and marketing, chemical manufacturing, coal coking, fuel burning, waste disposal, and food processing. Sources of organic solvent emissions include manufacture and application of protective coatings, manufacture of rubber and plastic products, degreasing and cleaning of metal parts, dry cleaning operations, printing, and manufacture of chemicals.

PB-190 399
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
DESCRIPTION AND EVALUATION OF A FLUOROSCOPIC SCREEN VISUAL BRIGHTNESS COMPARER,
John P. Ferguson, William S. Properzio, Emmet G. Murphy, and Ira R. Paul. Mar 70, 46p* DEP-70-3

Descriptors: (*Fluoroscopes, Viewing screens), (*Viewing screens, Brightness), (*Hazards, Fluoroscopes), Performance (Engineering), Exposure, Effectiveness, Medical equipment, Design, Diagnosis, Radiobiology, Safety.

The report describes a survey instrument developed to determine the performance characteristics of conventional fluoroscopic screens used in diagnostic radiology. NCRP Report No. 33 advises that the efficiency of a fluoroscopic screen be checked by comparison with a new screen. The instrument developed to help implement this recommendation is based on a visual comparison principle. The results of a field test of this fluoroscopic screen visual brightness comparer are presented and evaluated. (Author)

PB-190 489
National Air Pollution Control Administration, Washington, D.C.
AIR QUALITY CRITERIA FOR HYDROCARBONS.
Mar 70, 118p*
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25 as HE 20.1309:64.

Descriptors: (*Diseases, Air pollution), (*Air pollution, *Hydrocarbons), (*Photochemistry, Air pollution), (*Aldehydes, Air pollution), (*Exhaust gases, Hydrocarbons), (*Plants (Botany), Air pollution), Oxidation, Toxicity, Nitrates, Nitrogen oxides, Aromatic compounds, Aliphatic compounds, Chemical analysis, Benzenes, Ketones, Ethylenes, Irritating agents, Respiratory diseases, Eye, Passenger vehicles, California.
Identifiers: *Automobile exhaust, *Diesel engine exhaust, *Air pollution control equipment, *Smog, *Peroxyacetyl nitrate.

The document focuses on gas-phase hydrocarbons and certain of their oxidation products, particularly aldehydes, that are associated with the manifestations of photochemical air pollution. Particulate hydrocarbons, and more specifically polynuclear hydrocarbons, are not treated in the document. It is important to recognize that the criteria for hydrocarbons rest almost entirely on their role as precursors of other compounds formed in the atmospheric photochemical system and not upon the direct effects of the hydrocarbons themselves. The publication reviews the chemical and physical characteristics of hydrocarbons and their degradation products, especially aldehydes, and considers the basic analytical methods used for measuring the atmoshpheric content of these compounds. A brief review of the sources of hydrocarbons and principles of their control is included. The chemistry of hydrocarbon reactions in the atmosphere is briefly reviewed. The direct effects of hydrocarbons, essentially limited to vegetation damage from ethylene, are discussed. Toxicological data on hydrocarbons and aldehydes are also included. (Author)

PB-190 619
Bureau of Radiological Health, Rockville, Md. Office of Criteria and Standards.
RADIATION EXPOSURE OVERVIEW. NUCLEAR POWER REACTORS AND THE POPULATION,
William H. Oates, Jr. Jan 70, 32p BRH/OCS-70-1

Descriptors: (*Nuclear reactors, *Health physics), Power reactors, Standards, Radiological dosage, Radiological contamination, Population, Exposure, Nuclear radiation.

This overview provides information regarding the the radiological health aspects of nuclear power reactors. In addition to broadly documenting the exposures associated with this source of radiation, information presented may be useful for comparing the estimated radiation exposure of the public with that from other sources of environmental exposure. Data are included on the quantities of radioactivity discharged from nuclear power reactors to the environment and comparisons are made with applicable radiological health standards. (Author)

PB-190 717
Bureau of Radiological Health, Rockville, Md. Div. of Environmental Radiation.
RADIOACTIVE WASTE DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES,
Joe E. Logsdon, and Robert I. Chissler. Mar 70, 84p BRH/DER-70-2

Descriptors: (*Nuclear reactors, *Radiological contamination), Nuclear radiation, Exposure, Health physics, Population, Radiological dosage, Power reactors, Gas-cooled reactors, Isotopes, Boiling water reactors, Pressurized water reactors.

The discharges of radioactivity to the environment from nuclear power stations contribute to the radiation dose received by the general population. In order to provide a better technical basis for surveillance recommendations, radiological data relative to discharges of radioactivity from nuclear power facilities have been compiled. This report summarizes discharges of radioactive material to the environment from nine selected nuclear power facilities and relates the discharges to power produced and plant maintenance operations. The facilities included in this report represent three basic reactor types: pressurized water, boiling water, and high temperature gas. The operating facilities which are not included in this report either represent unique designs not being constructed in the present generation of power plants or they are smaller plants similar in design to those which are included. (Author)

PB-190 790
Eastern Municipal Water District, Hemet, Calif.
REUTILIZATION OF WASTEWATER RECYCLED THROUGH GROUND WATER. VOLUME I.
Progress rept. 1965-1968.
Dec 68, 144p W70-05466, FWPCA-16060-DDZ-12/69-Vol-1
Grant FWPCA-16060-DDZ
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. See also Volume 2, PB-190 791.

Descriptors: (*Water supplies, Recovery), (*California, Water supplies), Wastes (Sanitary Engineering), Removal, Irrigation systems, Rivers, Volume, Evapotranspiration, Salts.
Identifiers: San Jacinto Basin, Water conservation, Ground water, Water quality, *Water reclamation, Colorado river.

The water quality factors involved in the recharging of the San Jacinto Basin, California are evaluated so that the overall operation may be conducted in a manner to provide adequate protection of groundwater quality while permitting reclamation of wastes for regional water conservation. Another objective is to study the benefits to the salt balance problem caused by recharging. In the previous situation, some effluents were discharged to the San Jacinto River area and some were used as irrigation water. With recharge there is a significant reduction in evapotranspiration losses, thus improving groundwater quality by diluting the dissolved salts. The safe groundwater yield is limited to approximately 11,205 acre-feet/year. The volumes of water reclaimed and put underground to replenish the overdraft now average approximately 1430 acre-feet/year. Withdrawals now approximate 12,000 acre-feet/year, and importation of Colorado River water approximates 1900 acre-feet/year. Inflow of salt into the basin is now estimated at 5800 ton/year; 3900 ton/year from inflowing groundwater and 1900 ton/year from imported Colorado River water. (WRSIC abstract)

PB-190 791
Eastern Municipal Water District, Hemet, Calif.
REUTILIZATION OF WASTEWATER RECYCLED THROUGH GROUND WATER. VOLUME II. APPENDICES 1, 2, 3.
Progress rept. 1965-1968.

Dec 68, 107p W70-05466, FWPCA-16060-DDZ-12/69-Vol-2
Grant FWPCA-16060-DDZ
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE. See also Volume 1, PB-190 790.

Descriptors: (*Water supplies, Recovery), (*California, Water supplies), Wastes (Sanitary engineering), Removal, Irrigation systems, Rivers, Volume, Evapotranspiration, Salts.
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ton/year; 3900 ton/year from inflowing groundwater and 1900 ton/year from imported Colorado River water. (WRSIC abstract)

PB-190 799
Federal Water Pollution Control Administration, Washington, D.C. Div. of Applied Science and Technology.
STORM AND COMBINED SEWER DEMONSTRATION PROJECTS.
Water pollution control research series,
William A. Rosenkranz. Jan 70, 124p* FWPCA-DAST-36 W70-05467, FWPCA-11000-12/69

Descriptors: (*Urban planning, Sewage), (*Storms, Drainage), (*Drainage, Sanitary engineering), Reviews, Sanitary engineering, Wastes (Sanitary engineering), Abstracts, Reports, Maintenance equipment, Standards, Data processing systems, Water pollution.
Identifiers: Evaluation, Demonstration projects, Storm sewers, Overflows, Combined sewers, Combined sewerage systems, *Sewers.

Studies of combined storm and sanitary sewers and treatment of combined wastes are listed, abstracts of completed reports are presented, and active projects are described in information sheets. Subjects needing more research are also listed and described. Equipment, data methods, and criteria for urban drainage projects are outlined. (WRSIC abstract)

PB-190 800
Washington Univ., Seattle. Charles W. Harris Hydraulics Lab.
HYDRAULIC AND MIXING CHARACTERISTICS OF SUCTION MANIFOLDS.
Technical rept.,
Ronald E. Nece. Jun 69, 109p TR-26 W70-05468, FWPCA-16080-09/69
Grant FWPCA-WP-00512-5

Descriptors: (*Sewage, Jet mixing flow), (*Hydraulic systems, Sanitary engineering), Disposal, Feasibility studies, Design, Performance (Engineering).
Identifiers: *Manifolds.

Experimental data were obtained on the external hydraulic characteristics and mixing characteristics of suction manifolds to be used in feasibility and design studies of using such devices for predilution in sewer outfalls. Dilution rates and head loss characteristics are given for six single circular side-port manifolds, for multiport manifolds incorporating the same side ports, and for annular ports with and without axial symmetry. Density differentials have relatively little effect on the dilution-head loss characteristics of the configurations tested. Comparison of the two geometries tested shows that the annular-port manifold possesses hydraulic advantages over single circular side-port manifolds. Limitations of operating ranges of the manifolds in sewer outfall applications are delineated. (WRSIC abstract)

PB-190 870
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
REPORT OF TESTS MADE ON THE WESTINGHOUSE PANORAMIX (TRADE MARK) X-RAY MACHINE,
Ray C. Woodcock, and William S. Properzio. Mar 70, 43p* BRH/DEP-70-2

Descriptors: (*X-ray tubes, Hazards), Radiography, Voltage, Safety, Accuracy, Mobile.

The report describes physical measurements on the Panoramix X-ray machine as a partial basis for a radiological health evaluation of this unit. The results of logical health evaluation of this unit. The results of measurements to determine the accuracy of kilovoltage, measurements to determine the accuracy of kilovoltage, timer, and current calibrations, and an analysis of the radiation output, distribution, and intensity are presented. Comments are made regarding electrical hazards and the applicability of certain of the NCRP recommendations for medical and dental X-ray machines. (Author)

PB-190 876
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
EVALUATION OF A NORELCO-PITCHFORD PORTASPEC (TRADE MARK) PORTABLE X--RAY SPECTROGRAPH,
Ray C. Woodcock. Mar 70, 34p* BRH/DEP-70-4

Descriptors: (*X-ray spectroscopy, *Radiation hazards), Nuclear radiation spectrometers, Portable, X-ray tubes, Fluorescence, Scattering, Dose rate.
Identifiers: X-ray fluorescence.

Measurements made to determine physical and operating characteristics of a portable X-ray spectrograph are described and the results reported. The unit was designed for on-the-spot warehouse sorting and checking of specifications, identification and sorting of scrapmetals, and many other uses in mining and chemical plants. The tests reported here consist primarily of an analysis of the primary X-ray beam and of scattered radiation under various conditions of use. Some comments and recommendations relating to radiation safety in the use of the equipment are made. (Author)

PB-190 964
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
A STUDY OF HEAD AND NECK EXPOSURES FROM PANORAMIX (TRADE MARK) ROENTGENOGRAPHY,
James J. McMahon. Mar 70, 47p* BRH/DEP-70-5

Descriptors: (*X-ray photography, *Radiation hazards), (*Head, Radiation hazards), Radiography, Exposure, Dentistry, Tissues (Biology), Radiation effects, Radiological dosage, Dosimeters.
Identifiers: *Panoramix roentgenography.

A study was made of body organ exposures resulting from maxillo-facial panographic procedures using the Panoramix an intracavitary radiographic machine. Diagnostic examinations were simulated on a phantom and performed on several patients under laboratory conditions. Thermoluminescent dosimeters were placed at selected internal and external sites of a phantom human bust and at corresponding sites on several dental patients. Various operating parameters and techniques were used and the radiation at various locations was measured. The laboratory and clinical experiments were closely coordinated in order to compare data. The intraoral panoramic method gave exposures to eyes, thyroid and certain ectodermal tissues comparable to exposures from conventional complete mouth intraoral examinations and gave additional valuable diagnostic information. The basis for comparison was the diagnostically acceptable radiograph. (Author)

PB-190 994
Bureau of Radiological Health, Rockville, Md. Office of Information.
APPLICATION OF SMALL ACCELERATORS: PROCEEDINGS OF A SYMPOSIUM SPONSORED BY THE NEW YORK METROPOLITAN SECTION OF THE AMERICAN NUCLEAR SOCIETY, NEW YORK, N.Y., APRIL 8 AND 9, 1969.

May 70, 291p BRH/CFS-70-2

Descriptors: (*Radiobiology, Particle accelerators), (*Nuclear industrial applications, Particle accelerators), (*Health physics, Particle accelerators), (*Particle accelerators, *Symposia), Safety, Education, Training devices, Scientific research, Radiotherapy, Radiography, Shielding, Radioactivation analysis, Radiation hazards, Ion accelerators, Van de Graaff generators, Electron beams.

The Symposium on Applicators of Small Accelerators was intended to provide present and prospective users of small accelerators with a concise review of current and future applications of such machines. The following topics were discussed: The use of small accelerators in teaching; a nuclear physics teaching course with a 500-keV Van de Graaff; the use of the small accelerator in university laboratories; nuclear physics research; trends in medical application of small accelerators; the importance of the low energy accelerator in the small undergraduate physics department; fast neutron physics and thermonuclear research; trends in medical application of small accelerators; machine problems in generating neutrons for tumor therapy; operation of a medical cyclotron for the production of radioactive isotopes; the LINAC in radiology; industrial application of 14-MeV NEUTRON GENERATORS; ACTIVATION ANALYSIS IN THE ELECTRONICS INDUSTRY; ION IMPLANTATION WITH ACCELERATORS; THE RADIATION SHIELDING PROBLEM; PRACTICAL RADIATION PROTECTION MEASUREMENTS; A SOLUTION TO TRITIUM PUMP CONTAMINATION FOR SMALL ACCELERATORS; NEUTRON RADIOGRAPHY UTILIZING A SMALL ACCELERATOR; AND USE OF COMPUTERS AT ACCELERATORS. (Author)

PB-191 054
Research Triangle Inst., Durham, N.C.
COMPREHENSIVE ECONOMIC COST STUDY OF AIR POLLUTION CONTROL COSTS FOR SELECTED INDUSTRIES AND SELECTED REGIONS.
Final rept.,
M. E. Fogel, D. R. Johnston, R. L. Collins, D. A. LeSourd, and R. W. Gerstle. Feb 70, 382p* RTI-R-OU-455
Contract PHS-CPA-22-69-127

Descriptors: (*Air pollution, *Economics), (*Urban areas, Air pollution), (*Industries, Air pollution), Control, Sources, Emissivity, Standards, Costs, Particles, Sulfoxides, Hydrocarbons, Carbon monoxide, Incinerators, Generators, Boilers, Paper industry, Petroleum industry, Steel industry, Iron industry, Chemical industry, Coal, Cements, Metals.

Estimates were made of the costs of controlling the emissions of selected pollutants from twenty-two sources within 100 metropolitan areas. The pollutants selected are particulates, sulfur oxides, hydrocarbons, and carbon monoxide. The sources for which control cost estimates were made are solid waste disposal, steam-electric generating plants, industrial boilers, commercial and industrial heating plants, residential heating plants, and the following industrial categories: kraft pulp, iron and steel, gray iron foundry, primary nonferrous metallurgical (copper, lead, zinc, and aluminum), sulfuric acid, phosphate fertilizer, petroleum refining, cement, lime, coal cleaning, petroleum products and storage, grain milling (animal feed) and handling, varnish, rubber (tires and inner tubes), and secondary nonferrous metallurgical (copper, lead, zinc, and aluminum). Essential data defining regional and relevant process and air pollution control engineering characteristics required to support the cost analyses for each source are presented and analyzed in separate appendixes to the report.

PB-191 067
Los Angeles Dept. of County Engineering, Calif.
WASTE WATER RECLAMATION PROJECT FOR ANTELOPE VALLEY AREA.
Final rept.,
John A. Lambie. Aug 68, 229p W70-05645, FWPCA-17080-08/68
Grants WPD-50-01-64, WPD-50-02-65

Sponsored in part by Grants WPD-50-03-66 and WPD-50-04-67. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only.

Descriptors: (*Water supplies, California), (*Reclamation, Water supplies), Water pollution, Wastes (Sanitary Engineering), Chemicals, Algae, Fishes, Ecology, Coagulation, Radioactive isotopes, Odors, Personnel, Wastes (Industrial), Tracer studies, Soils, Irrigation systems, Bacteria, Viruses.
Identifiers: *Water reclamation, Antelope Valley (California), Water treatment, Los Angeles County, Limnology, Water quality.

An economically feasible waste water renovation process was developed in Los Angeles County. The tertiary treated product water is pathogenically safe, esthetically pleasing and suitable for fish life. Primary use of the water will be for an aquatic recreation park, but other anticipated uses include soil reclamation, irrigation, and industrial applications. These reuses of waste water will result in the conservation of the presently diminishing fresh water supply in this arid area. All research and testing was done with the knowledge that ultimately the public must accept the concept of reuse of renovated waste water for the project to be a total success. Esthetics of the product water, including clarity, color and odor were important aspects of the treatment process. Test data demonstrate that bacteriological and viral requirements can be met. Fish have successfully survived and propagated in the test ponds. Algal growth and nutrient levels of water in the pilot ponds are considered within acceptable limits. (WRSIC abstract).

PB-191 090
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
LABORATORY TESTING AND EVALUATION OF COLOR TELEVISION RECEIVERS ACQUIRED DURING THE IN-PLANT SURVEY,
Thomas M. Smith, Paul S. Ruggers, and Stephen W. Smith. Apr 70, 107p* BRH/DEP-70-6

Descriptors: (*Color television, *X rays), (*Television receivers, X rays), Hazards, Color television tubes, Voltage regulators, Rectifiers, Dose rate.

A field survey of domestic television manufactures was conducted from June 1969 to September 1969 to determine the x-ray emitting capability of television receivers manufactured after October 18, 1968. During this survey various receivers, identified as being capable of emitting x-radiation, were selected for additional laboratory testing. This report describes the laboratory tests on these receivers, presents the data obtained, and makes recommendations for the reduction or elimination of x-radiation emissions. (Author)

PB-191 091
Bureau of Radiological Health, Rockville, Md. Div. of Environmental Radiation.
RADIOLOGICAL SURVEILLANCE STUDIES AT A BOILING WATER NUCLEAR POWER REACTOR,
Bernd Kahn, Richard L. Blanchard, Herman L. Krieger, Harry E. Kolde, and David B. Smith. Mar 70, 124p* BRH/DER-70-1

Descriptors: (*Nuclear power plants, *Radiological contamination), (*Boiling water reactors, *Health physics), Radioactive waste, Radioactive isotopes, Fission products, Reactor operation, Water pollution, Air pollution, Atmospheric precipitation, Food, Animals, Water supplies, Radioactivity, Radiation monitors.

The projected increase in the use of nuclear power for electrical generating plants has resulted in both State and Federal public health agencies placing increased program emphasis on the surveillance of nuclear power plants. The Bureau of Radiological Health provides recommended nuclear facility surveillance program information for the guidance of health agencies. In order to provide a better technical basis for our surveillance recommendations, a series of field studies were conducted at operating nuclear facilities to obtain better data on radionuclides in plant effluents and their subsequent distribution in the environment. The technical report summarizes the first such study which was conducted at the Dresden Nuclear Power Station. (Author)

PB-191 215
MSA Research Corp., Evans City, Pa.
EFFECT OF ANTIBACTERIAL AGENTS ON MINE DRAINAGES. USE OF VIABLE ANTIBACTERIAL AGENTS TO REDUCE POLLUTION BY MINE DRAINAGES.
Water pollution control research series,
Robert E. Shearer, and William A. Everson. Nov 69, 149p FWPCA-DAST-21 FWPCA-14010-EGJ-11/69, W70-05959

Descriptors: (*Water pollution, *Coal), (*Bacteria, Water pollution), Drainage, Wastes (Industrial), Pseudomonadales, Iron, Sulfur, Antibiotics, Streptomyces, Control, Germicides.
Identifiers: *Coal mines, Caulobacter, *Mine waters.

The active agents in natural waters proviously found to inhibit bacterial production of acid in streams were investigated in the laboratory, and inoculations of natural water previously found to be inhibitory were made, about 14,000 gallons each, to a worked-out mine in Pennsylvania. After the first inoculation, tests showed absence of inhibitory power in the water at the time it was collected, and the water used for the second test was similarly found to be only weakly inhibitory. Strains of Caulobacter were found in the natural inhibitory waters, and when adapted to acidic environments and concentrated in culture media, they induced inhibition of acid production. Other adapted strains of Caulobacters also induced inhibition. Some evidence was shown that Caulobacter inhibitors might move downstream. Four species of Streptomyces tolerated acidic conditions, and were effective against the acid-producing bacteria in test tube cultures and on solid media. (WRSIC abstract)

PB-191 217
Underwater Storage, Inc., Washington, D.C.
CONTROL OF POLLUTION BY UNDERWATER STORAGE. FEASIBILITY OF PROVIDING TEMPORARY UNDERWATER STORAGE OF STORM OVERFLOW FROM A COMBINED SEWER SYSTEM.
Water pollution control research series.

Dec 69, 167p* FWPCA-DAST-29 FWPCA-11020-DWF-12/69, W70-06029
Contract DI-14-12-139
Prepared in cooperation with Silver, Schwartz, Ltd., Washington, D.C.

Descriptors: (*Sanitary engineering, Underwater equipment), (*Water, Storms), (*Water pollution, Control systems), Storage, Fluid flow, Bags (Containers), Feasibility studies, District of Columbia.
Identifiers: Combined sewers, Stormwater, Underwater storage, Pilot studies, Washington (District of Columbia).

A pilot plant was designed, constructed and operated to asses the feasibility of providing a facility for the collection, treatment, storage and final disposition of a portion of the storm overflow from a combined sewer system serving a thirty-acre drainage area in Washington, D.C. A Parshall flume was installed in the overflow line for measurement of flow rates and determination of total overflow volume. A portion of the overflow was diverted to the pilot plant through grit chambers and a comminutor. Flow was stored in two 100,000-gallon underwater bags fibricated of nylon reinforced synthetic rubber and fastened to the river bed by a system of patented anchors. During the period of storage, compressed air was delivered to the tanks for agitation of the solids. Following cessation of the storm, contents of the bags were pumped to the interceptor sewer for delivery to the District of Columbia Sewage Treatment Plant at Blue Plains. Flow into and out of each underwater storage tank was metered and recorded. Samples of the combined sewage overflow discharged to the bags and pumped discharge from the bags were collected and subjected to laboratory analyses. (Author)

PB-191 273
National Air Pollution Control Administration, Raleigh, N.C.
HIGHLIGHTS OF SELECTED AIR POLLUTION RESEARCH GRANTS.

May 70, 53p NAPCA-Pub-AP-70
Paper copy also available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.70 as HE 20.1309:70.

Descriptors: (*Air pollution, Reviews), Effectiveness, Humans, Animals, Agriculture, Economics, Political science, Physics, Chemistry, Meteorology, Control, Sources, Communication systems.

The contents include: List of principal investigators and institutions; Effects of air pollution on human health, welfare, or productivity; Effects of air pollution on agriculture; Economic and political studies; Analyses and physicochemical investigations; Development of analytic methods and equipment; Meteorology; Description and control of air pollution sources; Communication.

PB-191 394
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
SURVEY OF SELECTED INDUSTRIAL APPLICATIONS OF MICROWAVE ENERGY.
May 70, 79p* BRH/DEP-70-10

Descriptors: (*Industrial equipment, Microwave equipment), (*Microwaves, Hazards), Processing, Waveguides, Food, Wood, Driers (Apparatus), Heating, Reviews.

A survey was made of the industrial applications of microwave energy. This report reviews some of the features of microwave processing, describes the types of industrial microwave equipment, and discusses the uses to which microwave energy is being applied. Considerable eraphasis is placed upon the safety features built into the equipment, and recommendations are made for ensuring that the radiation leakage levels do not exceed the design limits. (Author)

PB-191 395
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
A COMPARISON OF MICROWAVE DETECTION INSTRUMENTS,
Robert L. Moore, Stephen W. Smith, Robert L. Cloke, and David G. Brown. Apr 70, 17p* BRH/DEP-70-7

Descriptors: (*Microwaves, *Power meters), Microwave equipment, Radiofrequency power, Detectors, Bolometers, Thermistors, Accuracy, Sensitivity, Reliability, Stability, Costs.

Microwave power density instrumentation can be classified according to intended use, the type of detection system employed, and the type of information displayed. The intended use is subdivided into desirable features for laboratory instruments and survey instruments; method of detection is broken into thermal and electrical detection; and the information display category is divided into quantitative and qualitative display. Several com-

mercial microwave power density meters which have been tested by the Division of Electronic Products, Bureau of Radiological Health, are compared according to the following criteria: accuracy, sensitivity, dynamic range, reliability, ease of measurement, thermal stability, battery life, and cost. (Author)

PB-191 396
Bendix Corp., Southfield, Mich. Bendix Research Labs.
DEVELOPMENT OF LIQUID CRYSTAL MICROWAVE POWER DENSITY METER.
Rept. for 1 Jul-30 Nov 69.
May 70, 24p* BRH/DEP-70-8 BRH/DEP-70-8
Contract PHS-CPE-R-69-28

Descriptors: (*Microwaves, *Power meters), Microwave equipment, Radiofrequency power, Crystals, Liquids, Calibration, Temperature, Colors.
Identifiers: *Liquid crystals, *Microwave power density meters.

We have developed a liquid crystal microwave power density meter. The meter has a Mylar membrane with resistive and liquid crystal coatings which serves as a large-area sensing element and uses direct current electrical power for bias and calibration of the membrane. The general operating principles of such an instrument and the design and operating characteristics of the particular meter constructed are described in the report. (Author)

PB-191 482
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
WORKBOOK OF ATMOSPHERIC DISPERSION ESTIMATES.
Environmental health series: Air Pollution,
D. Bruce Turner. 1970, 88p* PHS-Pub-999-AP-26

Descriptors: (*Air pollution, Aerosols), (*Aerosols, Scattering), (*Handbooks, Air pollution), Wind, Diffusion, Temperature, Aerodynamics, Models (Simulations).

The workbook presents methods of practical application of the binormal continuous plume dispersion model to estimate concentrations of air pollutants. Estimates of dispersion are those of Pasquill as restated by Gifford. Emphasis is on the estimation of concentrations from continuous sources for sampling times up to 1 hour. Some of the topics discussed are determination of effective height of emission, extension of concentration estimates to longer sampling intervals, inversion break-up fumigation concentrations, and concentrations from area, line, and multiple sources. Twenty-six example problems and their solutions are given. Some graphical aids to computation are included. (Author)

PB-191 538
West Virginia Pulp and Paper Co., Covington.
STUDY OF POWDERED CARBONS FOR WASTE WATER TREATMENT AND METHODS FOR THEIR APPLICATION.
Sep 69, 40p* W70-06264, FWPCA-17020-DNQ-09/69
Contract FWPCA-14-12-75

Descriptors: (*Sewage, *Carbon), (*Wastes (Sanitary engineering), *Adsorption), Porosity, Surface properties.
Identifiers: *Activated carbon treatment, *Sewage treatment.

Eleven commercial and experimental powdered activated carbons were subjected to an intensive laboratory evaluation of their physical and adsorptive properties to select those best suited to treating municipal waste water and to gain insight into properties important for this application. Correlations were made between capacities for absorbing organic impurities from municipal secondary effluent, as measured by TOC (Total Organic Carbon) adsorptive capacities, and carbon properties such as iodine value, molasses decolorizing index and pore structure. It is suggested that the best carbon for adsorbing organics from municipal wastes have a broad spectrum of pore sizes. Particle size of the powdered carbons was found to strongly affect the rate of adsorption. Aqua Nuchar, Hydrodarco, and pulverized Nuchar WV-L are recommended for further study. (WRSIC abstract)

PB-191 711
URS Research Co., San Mateo, Calif.
PRELIMINARY OPERATIONS PLANNING MANUAL FOR THE RESTORATION OF OIL-CONTAMINATED BEACHES.
Water pollution control research series.

Feb 70, 76p* W70-06319, FWPCA-15080-EOS-3/70
Contract DI-14-12-811

Descriptors: (*Beaches, Cleaning), (*Water pollution, Beaches), Handbooks, Earth-handling equipment.
Identifiers: *Oil pollution, *Oil spills.

An Operations Planning Manual was prepared for use by Federal Water Pollution Control Administration personnel involved in oil-spill cleanup operations. The surface conditions and topography of a beach contaminated with oil and the manner in which the oil has been deposited onto the beach will dictate the choice of equipment to be utilized and the operating procedures to be followed. The procedures tested utilize motorized graders, motorized elevating scrapers, front end loaders, and conveyor-screening systems. A motorized grader and motorized elevating scraper working in combination provide the most rapid means of beach restoration; and in addition, their use results in the removal of the smallest amount of uncontaminated beach material. (WRSIC abstract)

PB-191 712
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
REVIEW OF SANTA BARBARA CHANNEL OIL POLLUTION INCIDENT.
Water pollution control research series,
W. H. Swift, C. J. Touhill, W. A. Haney, R. E. Nakatani, and P. L. Peterson. 18 Jul 69, 165p*
FWPCA-15080-EAG-07/69, W70-06320
Contract DI-14-12-530

Descriptors: (*Beaches, Cleaning), (*Water pollution, *Oils), (*Petroleum, Leakage (Fluid)), Pacific ocean, Straw, Earth-handling equipment, Birds, Toxicity, Detection, Ecology, Ocean currents.
Identifiers: *Oil pollution, *Oil slicks, *Santa Barbara (California), *Water pollution detection.

The purpose of the review is to assemble a synopsis of defensive, control and clean-up activities in the Santa Barbara Channel in as much technical detail as possible. The major areas covered include: Environmental conditions; Description of the source; Management considerations; Control of released oil; Surveillance experience; Behavior of oil at sea; Beach and harbor problems; Restoration and disposal; Biology and ecology; Current research and development.

PB-191 765
National Association of Counties Research Foundation, Washington, D.C.
COMMUNITY ACTION GUIDEBOOK FOR SOIL EROSION AND SEDIMENT CONTROL.
Mel D. Powell, William C. Winter, and William P. Bodwitch. 1970, 68p W70-06574, FWPCA-15030-DTL-03/70

Descriptors: (*Water pollution, Control), (*Soils, Erosion), Sedimentation, Drainage, Law, Statistical data, Sources, Budgets, Organic materials, Particles, Transport properties, Rivers, Money, Standards, Handbooks, Floods.
Identifiers: Community planning, *Soil erosion, *Stream pollution.

Erosion and sediment, once thought of as rural problems, are causing extensive damage to the soil and water resources of developing communities. Sediment caused by careless development and construction has become one of the Nation's most serious sources of water pollution. This guidebook is intended to help local officials to organize, plan, finance, staff, and implement comprehensive sedimentation control programs. In addition, it should help local officials and administrators understand what is basically a technical problem; it will also help soil and water experts and technicians understand the administrative aspects of sedimentation control. This mutual understanding is necessary if effective control is to be achieved. The concepts and principles presented are based on a year of research, including visits to federal and state agencies and 14 visits to local sedimentation control programs across the United States. A model approach, with appropriate modifications, may be used by many local governments to control their sedimentation problems. (WRSIC abstract)

PB-191 800
Bureau of Radiological Health, Rockville, Md.
ADVANCES IN THE USE OF MICROWAVE POWER.
W. A. Geoffrey Voss. 1970, 32p* Seminar Paper-008

Descriptors: (*Microwave equipment, Reviews), (*Heaters, Microwaves), Engineering, Radiofrequency power, Safety, Attenuators, Radiofrequency, Radiobiology.
Identifiers: *Microwave ovens.

The industrial and domestic use of microwave power, as a source of heat, is increasing. The physical advantages of microwave heating, and the methods used to apply this form of energy in the processing industries are discussed. The need for a closer cooperation between the electronic systems designer and the environmental scientist is emphasized. Both have the responsibility of studying the biological effects of high frequency energy and ensuring the safety of operating personnel. The design of wavetraps and door seals will be considered in detail. Methods of both preventing and measuring leakage power in the microwave frequency spectrum is discussed. (Author)

PB-191 812
Georgia Univ., Athens. Dept. of Entomology.
FLUORESCENT PROBES IN THE DEVELOPMENT OF NEW ANALYTICAL METHODS FOR DETECTION OF WATER POLLUTION.
Annual rept. 1 Jun 69-31 May 70,
Chester M. Himel. 31 May 70, 18p* W70-06754,
FWQA-16020-EAO-05/70
Grant FWQA-16020-EAO

Descriptors: (*Water pollution, Insecticides), (*Insecticides, Chemical analysis), Fluorescence, Enzymes, Chemical equilibrium, Synthesis (Chemistry), Acetylcholinesterase, Cholinesterase.
Identifiers: *Spectroscopic analysis, Fluorometric analysis, *Naphthalene sulfonamide/dimethylamino.

The application of fluorescent probe-enzyme systems to detection of water pollution by insecticides was studied to determine the scientific and practical feasibility of this new concept. Many suitable fluorescent probe molecules can be synthesized. In combination with serum cholinesterase enzyme, these fluorescent probe-enzyme systems give a significant spectroscopic response in the presence of insecticides. A total of

18 new candidate fluorescent probe molecules were synthesized. Of those tested, 4 are useful probe molecules. (Knapp-USGS) (WRSIC abstract)

PB-191 873
North Carolina State Univ., Raleigh. Dept. of Wood and Paper Science.
DILUTE SPENT KRAFT LIQUOR FILTRATION THROUGH WOOD CHIPS.
Water pollution control research series.

Apr 70, 36p W70-06961, FWPCA-12040-EZZ-04/70
Grant WPRD-115-01-68

Descriptors: (*Paper industry, *Water pollution), (*Filters (Fluid), *Wood), Wood pulp, pH, Organic materials, Purification, Wastes (Industrial).
Identifiers: Chips, *Kraft wood pulps, *Pine wood, Biochemical oxygen demand.

The principal objective of this project was to determine if contact between effluent from a Kraft pulp mill and pine chips would reduce the water pollution characteristics of the waste liquor. The experimental work was divided into two phases: (1) a small scale laboratory investigation of contacting dilute waste liquor with chips; (2) a pilot-scale investigation of filtering waste liquor through a column and a pile of chips. It was found that contact of alkaline waste liquor, or even distilled water, with pine chips extracted organic matter from the chips which had a considerable BOD. This extract corresponded to a pollution load of about 3-11 lbs. BOD per ton of dry wood. Alkalinity, pH, and intensity of color of the waste liquor were somewhat reduced by the contact. These reductions are, however, too small to have any practical application in effluent treatment. It can, in general, be concluded that contact of alkaline waste liquor, or water, with wood chips extracts soluble organics and adds pollutional materials to the effluent stream. (Author)

PB-191 876
Robert A. Taft Water Research Center, Cincinnati, Ohio.
ELKINS MINE DRAINAGE POLLUTION CONTROL DEMONSTRATION PROJECT,
Ronald D. Hill. 20 May 70, 21p W70-06965, FWQA-14010-04-70
Presented at Symposium on Coal Mine Drainage Research (3rd) Mellon Inst., Pittsburgh, Pa., 20 May 70, p284-303.

Descriptors: (*Water pollution, Control), (*Underground structures, Drainage), Coal, pH, Surfaces, Terrain, Reclamation, Plants (Botany), Seals, Inland waterways, Effectiveness, Contamination.
Identifiers: Elkins (West Virginia), *Acid mine drainage, *Land reclamation, Roaring Creek, Watersheds, Grassy Run, Strip mines, Stream abatement.

In 1964, a mine drainage pollution control demonstration project was undertaken near Elkins, West Virginia. The area contained a large drift mine (3,000 acres) which had been extensively surface mined along the outcrop. The objective of the project was to determine the effect on the water quality of 'air' sealing and diverting water away from the underground mine and reclaiming the surface mines. Some 450 subsidence holes were filled, over 12.5 miles of surface mines were reclaimed and 101 seals constructed. Approximately 640 acres of land were disturbed during reclamation which were revegetated in the spring of 1968. This paper reports the effectiveness of the reclamation work for the first two years following construction. The reclamation and revegetation of the surface mines and refuse piles have shown some benefits, however, an equilibrium condition has not been established and the long term effects have yet to be determined. While some areas have shown trends of continued improvement, others showed an improvement the first year, followed by some deterioration the second year. Air sealing, under the conditions at Elkins was unsuccessful, except for one site, the oxygen concentration behind the seal has not decreased and the pollution loads have not decreased. For the combined watershed of Roaring Creek and Grassy Run there has been over a 1,500 ton decrease in the acidity load for the base year 1966. However, none of the streams in either watershed has returned to its unpolluted state. (WRSIC abstract)

PB-191 906
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
PRODUCT TESTING AND EVALUATION OF GIANT VIEW (TRADE MARK) TV PROJECTOR,
Paul S. Ruggera. May 70, 32p* BRH/DEP-70-9

Descriptors: (*Television display systems, Radiation hazards), Cathode ray tubes, Shielding, Data, Measurement.

The report presents x-radiation data recorded from the kinescope of a projection television unit. The model tested had a moveable kinescope housing which, when extended, essentially removed the shielding effect of the cabinet. Measurements were made under typical operating conditions, and these were related to the two extremes of kinescope position. In addition, a leaded kinescope of the same type was substituted, and data showing the relationship between the lead content of the glass envelope and the emission rate are reported. (Author)

PB-192 042
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
LEAKAGE VARIATIONS FROM MICROWAVE OVENS.
Jun 70, 33p BRH/DEP-70-11

Descriptors: (*Cooking devices, Microwaves), Radiation hazards, Test methods, Seals.
Identifiers: *Microwave ovens.

Some microwave radiation leakage is generally associated with the operation of microwave ovens. This leakage usually occurs around the door seals and varies with the type, size, and placement of food or other loads within the oven cavity. This report describes field and laboratory studies that were performed to determine the most important variables and their effect on microwave oven radiation leakage levels. Additional field observations of ovens in use should be conducted to more clearly define the correlation between food types, sizes, and placement, and door closing and opening procedures. (Author)

PB-192 087
Federal Water Quality Administration, Norton, W. Va. Norton Mine Drainage Field Site.
NEUTRALIZATION OF HIGH FERRIC IRON ACID MINE DRAINAGE,
Roger C. Wilmoth, and Robert B. Scott. 19 May 70, 29p W70-07149, FWQA-14010-05/70
Presented at Symposium on Coal Mine Drainage Research (3rd), Pittsburgh, Pa. 19 May 70.

Descriptors: (*Mining engineering, Wastes (Industrial)), (*Wastes (Industrial), Neutralization), Inorganic acids, Iron, Drainage, Water pollution, pH, Limestone, Calcium oxides, Sodium compounds, Carbonates.
Identifiers: *Mine waters, Sodium carbonates, Coal mines.

The Norton Mine Drainage Field Site of the Federal Water Quality Administration has been conducting research on the feasibility of acid mine drainage treatment using lime, limestone, and soda ash neutralization. The Norton research facility is located at Norton, West Virginia, on the banks of Grassy Run--a small, heavily polluted stream of which an estimated 90% of the water flow is from abandoned mines. Tests were run on identical samples of Grassy Run water to determine the quality of the supernatant when the sample was neutralized to various pH's. Lime, limestone, and soda ash were each tested as the neutralizing agents. All 3 neutralizing agents--lime, limestone, and soda ash--can meet the pH 6.5, net alkalinity, iron below 7.0 ppm criteria with relative ease. The major differences between soda ash neutralization and lime or limestone neutralization are that soda ash produces low hardness, low calcium, high sodium, and high cost, whereas all other chemical parameters are comparable between the 3 neutralizing agents. (WRSIC abstract)

PB-192 091
Federal Water Quality Administration, Washington, D.C.
RESEARCH DEVELOPMENT AND DEMONSTRATION PROJECTS.

1 Apr 70, 339p* W70-07230, FWQA-10000-4/70

Descriptors: (*Water pollution, Scientific research), (*Wastes (Industrial), Water pollution), (*Wastes (Sanitary engineering), Water pollution), Indexes, Pesticides, Petroleum, Metals, Agriculture, Food, Standards.
Identifiers: *Agricultural wastes, *Mine acid drainage, *Mine waters, *Water pollution control equipment, *Water resources, *Oil pollution, Sewage treatment.

A total of 331 information sheets were compiled in the following categories: Municipal-pollution control technology (88); Industrial-pollution control technology (112); Agricultural-pollution control technology (26); Mining-pollution control technology (44); Other-sources-of-pollution control technology (36); and Water resources planning and resources data (25). (WRSIC-abstract)

PB-192 220
Pennsylvania State Univ., University Park. Center for Air Environment Studies.
GUIDE TO RESEARCH IN AIR POLLUTION: PROJECTS ACTIVE IN CALENDAR YEAR 1969.
7th ed.

Apr 70, 198p NAPCA-Pub-AP-47, PHS-Pub-981
Contract PHS-CPA-22-69-37
Paper copy also available from Superintendent of Documents, GPO, Washington, D. C. 20402. $1.50 HE21.1308:R31.

Descriptors: (*Air pollution, Bibliographies), United States, Government (Foreign), Control, Chemistry, Physics, Biochemistry, Inventory, Effectiveness, Animals, Humans, Materials, Sources, Meteorology.

Information about 1383 projects active in calendar year 1969 was compiled from respondents to a questionnaire. The compilation has three main parts. (1) The project listing for United States projects are arranged alphabetically by States, and for foreign projects they are arranged alphabetically by country. Within each geographic location, the listing is further alphabetized by performing organization. Each entry also includes the project title, name of the investigator and address, the sponsor, and the type of support. The entries are numbered sequentially with 'project numbers'. (2) The categorical listing or subject index, is arranged alphabetically by 19 subject categories. Within each category, the listing is further alphabetized by project title. Following each project title, its project number appears. (3) The principal investigator listing or index is arranged alphabetically. Following each investigator's name, the project number and citations of publications and presentations resulting from the project appear. (Author)

PB-192 222
National Air Pollution Control Administration, Raleigh, N.C.
ATMOSPHERIC EMISSIONS FROM WET--PROCESS PHOSPHORIC ACID MANUFACTURE.
Apr 70, 98p NAPCA-Pub-AP-57
Paper copy also available from Superintendent of Documents, GPO, Washington, D. C. 20402. Price $0.45 as HE20.1309:57. Prepared in cooperation with Mfg. Chemists' Association, Inc.

Descriptors: (*Chemical industry, Air pollution), (*Air pollution, *Phosphoric acids), (*Fluorides, Air pollution), Ores (Nonmetallic), Silicon compounds, Hydrogen compounds, Dust, Sampling, Spectroscopy.
Identifiers: Silicon tetrafluoride, Hydrogen fluoride, Chemical plants, Scrubbers.

Wet-process acid is produced by treating fluorapatite (Ca10 (PO4)6F2) or phosphate rock, with sulfuric acid. Phosphate rock must be finely ground to react properly with sulfuric acid, and standard control equipment is normally used to prevent objectionable dust emissions. The emissions of most concern are fluoride compounds liberated from the rock by the sulfuric acid. These consist of hydrogen fluoride, silicon tetrafluoride, and some products of reaction and decomposition of the latter. Most phosphate rock contains 3.5 to 4 percent fluorine, and half of this may be volatilized in the processing. This represents a large potential source of pollution. Because of the principal atmospheric contaminants generated in the process are gaseous fluorides, vapor scrubbing is universally employed to control emissions. Specific devices used for control include venturi scrubbers, impingement scrubbers, and various kinds of spray towers. The results of MCA-PHS stack tests on ten wet-process phosphoric acid plants in various parts of the country are tabulated. The major source of gaseous fluoride emissions in wet-process phosphoric acid plant is the digester. Only trace quantities of particulate fluorides are normally present in exit gases from digesters and filters, and these can be removed effectively by scrubbing. (Author)

PB-192 223
National Air Pollution Control Administration, Raleigh, N.C.
CHARACTERISTICS OF PARTICULATE PATTERNS, 1957-1966,
Robert Spirtas, and Howard J. Levin. Mar 70, 105p NAPCA-Pub-AP-61
Errata sheet inserted. Paper copy also available from Superintendent of Documents, GPO, Washington, D. C. 20402. Price $0.50 as HE20.1309:61.

Descriptors: (*Air pollution, Particles), (*Dust, Air pollution), Periodic variations, Urban areas, Rural areas, Sampling, Meteorological parameters.

The National Air Surveillance Networks (NASN) have collected samples of suspended particulate matter since 1957. The resulting suspended particulate data are graphically summarized by the application of Whittaker-Henderson Type A curve-smoothing formulas to 10 years of data. Data from 60 urban stations and 20 nonurban stations were studied by this technique, which brings out the underlying cyclical patterns and long-term trends in nationwide levels of suspended particulate matter. Seasonal patterns are evident for many urban and nonurban stations, and the seasonal characteristics of the two types of stations contrast sharply. Long-term trends are downward at many center-city urban sites, but are upward at some nonurban sites. (Author)

PB-192 224
City Coll., New York. Dept. of Chemistry.
SENSORY EVALUATION OF DIESEL EXHAUST ODORS,
Amos Turk, Janet T. Wittes, L. R. Reckner, and R. E. Squires. Feb 70, 64p
Contract PH-27-66-96, PHS-CPA-69-528
Prepared in cooperation with Harvard Univ. Cambridge, Mass. and Scott Research Labs., Inc. Perkasie, Pa. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.70 as HE 20-1309:60.

Descriptors: (*Air pollution, Diesel engines), (*Diesel engines, Exhaust gases), (*Exhaust gases, Odors), (*Odors, *Sensory perception), Humans, Detection, Tests, Intensity, Standards, Statistical analysis, Air, Purification.

Exhaust gases emitted by diesel engines are characterized by offensive odors, which can be rated numerically by human judges. Correlation of such ratings with the chemical composition of diesel exhaust will aid in (1) establishing Federal standards for diesel exhaust emissions and (2) developing methods of diesel odor control. Part 1 presents instructions for the training of judges to rate the odors in terms of intensity and quality standards provided to them for reference. Part 2 describes the physical arrangement of an exhaust dilution and panel exposure system. It describes the performance of odor evaluation tests, design of test programs, and statistical analysis of test data. Appendices describe (A) the theoretical basis for air purification requirements in test chambers, (B) composition and makeup of diesel odor standards, and (C) mathematical derivations of the statistical procedures. (Author)

PB-192 250
Davis (W. E.) and Associates, Leawood, Kans.
NATIONAL INVENTORY OF SOURCES AND EMISSIONS: CADMIUM, NICKEL, AND ASBESTOS - 1968. CADMIUM, SECTION I.
Feb 70, 53p* APTD-68
Contract PHS-CPA-22-69-131
See also Section 2, PB-192 251 and Section 3, PB-192 252.

Descriptors: (*Air pollution, *Cadmium), (*Industries, Air pollution), Sources, Wastes (Industrial), Cadmium compounds, Metallurgy, Industrial plants, Mining engineering, Zinc, Lead, Copper, Metals, United States, Industrial production, Batteries + components.
Identifiers: *Emission inventory, *Source inventory.

The aim is to provide reliable information regarding the nature, magnitude, and extent of the emissions of cadmium in the United States for the year 1968. Background information concerning the basic characteristics of the cadmium industry has been assembled and included. Process descriptions are given, but they are brief, and are limited to the areas that are closely related to existing or potential atmospheric losses of the pollutant. The apparent consumption was 13.3 million pounds, and domestic production 10.6 million pounds. Only a small amount of cadmium was recovered from scrap. Emissions to the atmosphere during the year totaled 4.6 million pounds. Emissions from the metallurgical processing plants of the primary producers of cadmium, zinc, lead, and copper were more than 2 million pounds, and those from melting operations in the iron and steel industry were about the same. Emission estimates for mining, metallurgical processing, and reprocessing operations are considered to be reasonably accurate. They are based on data obtained by personal contact with the processing and reprocessing companies. (Author)

PB-192 251
Davis (W. E.) and Associates, Leawood, Kans.
NATIONAL INVENTORY OF SOURCES AND EMISSIONS: CADMIUM, NICKEL, AND ASBESTOS - 1968. NICKEL, SECTION II.
Feb 70, 46p* APTD-69
Contract PHS-CPA-22-69-131
See also Section 1, PB-192 250 and Section 3, PB-192 252.

Descriptors: (*Air pollution, *Nickel), (*Industries, Air pollution), Sources, Wastes (Industrial), Nickel compounds, Industrial plants, Industrial production, Coal, Fuels, Combustion products, Mining engineering, Metallurgy, Batteries + components, Steel, United States.
Identifiers: *Emission inventory, *Source inventory.

The aim is to provide reliable information regarding the nature, magnitude, and extent of the emissions of nickel in the United States for the year 1968. Background information concerning the basic characteristics of the nickel industry has been assembled and included. Process descriptions are given, but they are brief, and are limited to the areas that are closely related to existing or potential atmospheric losses of the pollutant. Consumption for the year was reported to be 159,306 tons and domestic production to be 29,215 tons including the production from both primary and secondary sources. Imports, mostly from Canada, totaled 147,950 short tons. Emissions to the atmosphere during the year were 6,475 short tons. About 83 percent of the emissions were due to the burning of heavy fuel oil and coal. Estimates of emissions for mining, metallurgical processing, and reprocessing operations are based on data obtained by personal contact with processing and reprocessing companies, and are considered to be reasonably accurate. (Author)

PB-192 252
Davis (W. E.) and Associates, Leawood, Kans.
NATIONAL INVENTORY OF SOURCES AND EMISSIONS: CADMIUM, NICKEL, AND ASBESTOS - 1968. ASBESTOS, SECTION III.

Feb 70, 56p* APTD-70
Contract PHS-CPA-22-69-131
See also Section 1, PB-192 250 and Section 2, PB-192 251.

Descriptors: (*Air pollution, *Asbestos), (*Industries, Air pollution), Sources, Wastes (Industrial), Industrial plants, Mining engineering, Industrial production, Construction materials, Textiles, Paper, United States.
Identifiers: *Emission inventory, *Source inventory.

The aim is to provide reliable information regarding the nature, magnitude, and extent of the emissions of asbestos in the United States for the year 1968. Background information concerning the basic characteristics of the asbestos industry has been assembled and included. Process descriptions are given, but they are brief, and are limited to the areas that are closely related to existing or potential atmospheric losses of the pollutant. The apparent consumption for the year was 817,363 tons and the domestic production was only 120,690 tons. Imports, mostly from Canada, totaled 737,909 short tons. There was no recovery from scrap. Emissions to the atmosphere during the year were 6,579 tons. About 85 percent of the emissions were due to mining and milling operations. Estimates of emissions are based for the greatest part on observations made during field trips, and on the limited information provided by mining, milling, and reprocessing companies. Information was not available regarding the magnitude of the emissions or the particulate size. There were no emission records at any of the locations visited. (Author)

PB-192 310
Engineering-Science, Inc./Texas, Austin.
THE CHARACTERISTICS AND POLLUTIONAL PROBLEMS ASSOCIATED WITH PETROCHEMICAL WASTES.
Summary rept.,
Earnest F. Gloyna, and Davis L. Ford. Feb 70, 107p* W70-07511, FWPCA-12020-2/70
Contract DI-14-12-461

Descriptors: (*Water pollution, *Petroleum industry), (*Wastes (Industrial), Water pollution), Industrial plants, Water supplies, Costs, Control, Oxidation, Effectiveness.
Identifiers: *Water treatment, *Biochemical oxygen demand.

Each of the major processes developed by the industry should be studied with the objective of evaluating the trends in plant locations, effects on area-wide water quality, and treatment requirements. Since there will be no significant changes in petrochemical feedstocks, the patterns of feedstock usage should be monitored and major changes evaluated in terms of the water use and water reuse requirements, potential pollution problems, and product development. Because the main contribution to environmental pollution from the petrochemical industry emanates from process waste streams, comparative cost analyses should be made on typical recycle (feedstock) practices and on associated wastewater treatment requirements. Master plans for in-plant wastewater collection should include facilities to segregate process waste from less contaminated streams. Problem areas in the physical, chemical and biological treatment processes, as well as disposal methods, are listed. A detailed and basic study should be initiated to evaluate the cost of treating wastes from single plants or process streams with combined wastes from several plants. (Author)

PB-192 321
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
STUDY OF UNCONVENTIONAL THERMAL, MECHANICAL, AND NUCLEAR LOW-POLLUTION-POTENTIAL POWER SOURCES FOR URBAN VEHICLES.
Summary rept. 17 May 67-15 Mar 68,
J. A. Hoess, E. S. Cheaney, F. A. Creswick, D. A. Trayser, and R. D. Fischer. 15 Mar 68, 171p
Contract PH-86-67-109

Descriptors: (*Passenger vehicles, Power equipment), Nuclear energy, Heat engines, Air pollution, Specifications.

The purpose of the program was to provide background information and recommendations required for development of future research and development programs on low-pollution-potential propulsion systems for urban vehicles. The study itself consisted of a first screening of possible alternative systems to identify those that were the most promising so that future efforts could be concentrated on these. So as not to screen out systems that could be enhanced through directed research and development efforts, alternative systems were evaluated on the basis of the characteristics that they could be expected to have 10 to 15 years in the future, assuming that development efforts were expended on them. As a result of the study, a few alternative propulsion systems have been identified as being quite promising for urban-vehicle application, while a large number of systems were found to be unsuitable for such application. (Author)

PB-192 322
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
THE EFFECT OF INSTRUMENT AVERAGING TIME ON MICROWAVE POWER DENSITY MEASUREMENTS.
Jun 70, 35p BRH/DEP-70-12

Descriptors: (*Radiometers, Microwave equipment), (*Radiation hazards, Microwaves), Radiofrequency power, Density, Measurement, Accuracy, Sensitivity.

The response of the Narda 8100 system to a stepped input of microwave power was measured with a video tape recorder. The Narda 8100 was then used to measure variations in microwave power density due to 'mode stirring'. This report discusses the averaging effect caused by the response time of the instrument system on the observed power density. Examples of averaged values of power density from microwave ovens are included. (Author)

PB-192 377
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
SIMPLE X-RAY DETECTION INSTRUMENTS FOR TELEVISION SERVICE TECHNICIANS.
Richard K. Stoms, and Edward Kuerze. Jun 70, 34p* BRH/DEP-70-14

Descriptors: (*Color television, *X rays), (*Radiation measurement systems, X rays), Television receivers, Count rate meters, Geiger counters, Circuits.

Simple circuits for detecting x rays by means of a thin (36 mg/sq cm) aluminum-wall organic-quenched cylindrical Geiger-Mueller counter are described. The first presents visible and audio output representing the detector counting rate. The second incorporates a count-rate meter circuit. A manually switched and an electronic oscillator high-voltage supply are described. A simple circuit and procedure for count-rate calibration of the metered circuit are given. All circuits are readily constructed from commonly available components. (Author)

PB-192 419
Bureau of Mines, Washington, D.C.
WATERS FOR WATERFLOODING SAN JOAQUIN VALLEY, CALIF., PETROLEUM RESERVOIRS.
Rept. of investigations,
George Laurence Gates, and W. H. Caraway. Jun 70, 22p RI-7401

Descriptors: (*Petroleum, Production), (*Rock (Geology), Water injection), Water, Sources, California.
Identifiers: *Waterflood oil recovery, Oil recovery, San Joaquin Valley (California), *Reservoir engineering.

Five possible sources of water for waterflooding of petroleum reservoirs in the arid San Joaquin Valley of California were considered. Three of them (water produced with petroleum, water from a shallow saline aquifer, and waste irrigation water) were analyzed chemically; laboratory information for one (sea water) had been developed during a previous study. A series of laboratory tests made on the fifth source (fresh water) determined the solubility of calcium sulfate dihydrate in water. Laboratory analyses included the following: Chemical analyses of water produced with petroleum and waste irrigation water; solubility of calcium sulfate dihydrate in water and brines; the effect of excess sulfate on the solubility of calcium sulfate in brines; the presence of sulfate-reducing bacteria; and the permeability of cores from a petroleum reservoir to air, to water from other petroleum reservoirs, and to waste irrigation water. The results showed that most of the waters and mixtures of waters are compatible with petroleum reservoir waters and are generally suitable for injection. The calcium content of some of the formation waters is quite high, and care must be taken to prevent precipitation of calcium sulfate dihydrate. The permeability of the few cores tested was about the same to water and brines as to air, indicating that formation damage due to clay swelling will not be serious. The waters most likely to be available for injection are water produced with petroleum, water from shallow saline aquifers, and waste irrigation water. (Author)

PB-192 446
National Air Pollution Control Administration, Cincinnati, Ohio.
INTERSTATE EFFECTS SURVEILLANCE NETWORK. TABULATION OF DATA JANUARY--DECEMBER 1969.

May 70, 200p NAPCA-APTD-70-3

Descriptors: (*Air pollution, Data), Measurement, Metals, Corrosion, Textiles, Discoloration, Nylon, Deterioration, Rubber, Cracks, Particles, Sulfur compounds, Oxides.

Raw data are tabulated on air pollution effects on materials at 274 stations throughout the U.S. and in Ontario, Canada, for calendar year 1969. The tables are titled: Station and Area Type Code; Effects Stations Identification List; Cumulative Frequency Distributions; Metal Corrosion; Dyed Fabrics; Silver Tarnishing; Lead Plates; Dustfall; Nylon Deterioration; Rubber Cracking; Sticky Paper (Wind Blown particulates); and Station Index (Alphabetized by State). (Author)

PB-192 478
Stanford Research Inst., Menlo Park, Calif.
INQUIRY INTO THE ECONOMIC EFFECTS OF AIR POLLUTION ON ELECTRICAL CONTACTS.
Final rept.,
Robert C. Robbins. Apr 70, 101p APTD-67
Contract PH-22-68-35

Descriptors: (*Air pollution, Electric connectors), (*Electric connectors, Reliability (Electronics)), Failure (Electronics), Economics, Inhibition, Corrosive gases, Decontamination, Metal coatings.
Identifiers: *Electric contacts.

Prevention of contact failure in low voltage contacts is the largest problem. Millions of low voltage contacts are used in computer and instrumentation circuits, and some provision must be made to ensure their reliable and continued operation. The sulfur gases are primarily responsible for the deleterious effect of air pollution on these contacts. More money is spent in the protection of low voltage contacts against the effects of sulfur gases than in all the other contact problem areas combined. Protection of low voltage contacts against sulfur gases takes two forms: the use of air conditioning and air purification equipment; the other kind of protection of contacts against sulfur gases is precious metal plating. The cost relating to failure of electrical devices caused by air pollution for 1968 is estimated to be about $64 million in the United States. Reducing current air pollution by 50 percen6 would have little effect on air pollution costs related to electrical devices, because any reduced level of recognized air pollution would still require that measures taken to combat air pollution effects be continued at the same level of effort. Industry does not know the amount of air pollution reduction needed to appreciably reduce the damaging effects on electrical contacts. (Author)

PB-192 510
Southwest Research Inst., San Antonio, Tex. Dept. of Structural Research.
FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109 (TIRES). SEMPERIT OSTERRICHISCH-AMERIKANISCHE GUMMI WERKE AKTIENGESELLSCHAFE (AUSTRIA).
Compliance test rept.

Jul 70, 37p* DOT-HS-610 110

Descriptors: (*Tires, Tests), (*Safety, Tires), Vehicle chassis components, Visual inspection, Environmental tests, Loading (Mechanics), Failure (Mechanics), Wear resistance, Standards, Passenger vehicles.
Identifiers: Evaluation, Failure analysis, Semperit tires.

The report pertains to tests conducted on Semperit 5.60x15 (4 ply), 7.00x13 (4 ply), 7.35Hx14/185Hx14 (4-ply sidewall/6-plytread), 185SRx14 (2/6 ply), and 185HRx14 (2/6 ply) tires by an independent

contractor as part of the National Highway Safety Bureau's compliance testing program to determine whether or not motor vehicles and items of motor vehicle equipment comply with applicable Federal Motor Vehicle Safety Standards. (Author)

PB-192 633
Sonics International, Inc., Dallas, Tex.
ULTRASONIC EMULSIFICATION OF OIL TANKER CARGO.

Apr 70, 17/p* W70-07996, FWQA-15080-DJQ-04/70

Descriptors: (*Petroleum, *Colloids), (*Oil, *Water pollution), (*Tankers, Petroleum), Fishes, Costs, Ultrasonic radiation, Safety, Films, Toxicity.
Identifiers: *Oils pollution, *Oil slicks, *Emulsification, *Water pollution control equipment, Dispersing.

The purpose of this project was to study the feasibility of producing emulsified oil at a rate comparable with conventional tanker loading rates and to investigate the economic and ecological factors. To determine blender design parameters and emulsified oil characteristics, two crude oils and one fuel oil were chosen. A Libyan light oil, a Venezuelan oil and no. 6 Fuel Oil were used. Only two emulsifiers were used and they were base-neutralized sulfonated nonionics. These are compatible with sea water and of low toxicity. The emulsions tested were oil-in-water. Oil was the internal phase and 97% of the total. Water and chemical was the external phase and 3% of the total. The tests on the emulsions were to determine: stability under simulated transportation conditions, dispersibility in sea water, toxicity to fish, and product alteration. Included were tests with safety aspects: evaporation rates, flash points, vapor pressures and rupture leak tests. An economic study was made which shows emulsification costs of about 20 cents per barrel without considering possible offsets or side benefits. (Author)

PB-192 634
Resource Engineering Associates, Wilton, Conn.
STATE OF THE ART REVIEW ON PRODUCT RECOVERY.

Nov 69, 113p* W70-07997, FWQA-17070-DJW-11/69
Contract FWPCA-14-12-495

Descriptors: (*Wastes (Industrial), Recovery), (*Water pollution, Wastes (Industrial)), (*Reviews, Water pollution), Electrodialysis, Ion exchange, Solvent extraction, Control, Economics, Taxiing, Paper industry, Steel industry, Mining engineering, Petroleum industry, Textile industry, Chemical industry, Nuclear power plants, Fertilizers, Plating, Evaporation, Adsorption, Distillation, Chemical precipitation.
Identifiers: Filtration, *Water pollution control equipment.

The recovery, reuse and sale of materials from liquid effluents, or produced as a result of the treatment of liquid effluents is discussed. A critical review of literature up to date on product recovery in major water use industries is presented. The economical, technical and philosophical framework which determines the application of product recovery is presented wherever possible. This report does not cover water renovation for reuse and product recovery from solid wastes. However, an evaluation of the utilization and product recovery of municipal sludge is presented. The principal areas of discussion are waste reduction practices including in-plant control, recovery techniques and practices, practical operating problems and the relationship between recovery and treatment. It is concluded that product recovery is an accepted practice with increasing usage; industry needs increasingly complex processes to develop optimum recovery schemes; by-product recovery results in a net cost to industry generally of a smaller magnitude then conventional treatment; and the situation is complicated by the tax exemption laws. (Author)

PB-192 637
Rutgers - The State Univ., New Brunswick, N.J. Water Resources Research Inst.
INSTREAM AERATION OF POLLUTED RIVERS,
William Whipple, Jr., Joseph V. Hunter, Burton Davidson, Frank Dittman, and Shaw Yu. Aug 69, 209p* FWPCA-16080-DUP W69-09555, OWRR-A-999-NJ (5)

Descriptors: (*Water pollution, New Jersey), (*Rivers, Decontamination), Oxygen, Air, Quality control, Simulation, Photosynthesis, Test equipment, Wastes (Sanitary Engineering), Protection, Contamination, Wastes (Industrial), Feasibility studies, Costs.
Identifiers: *Passaic River, *BOD (Biochemical Oxygen Demand), Biochemical oxygen demand, *Water quality, *Aeration.

Mechanical and diffuser instream aerators were tested on the Upper Passaic River and proved a practical and economical method of adding dissolved oxygen to polluted streams. The tests were conducted in conjunction with research into photosynthesis, benthal oxygen demand, and mass balance of BOD in that river system. Systems of aerators were designed to provide for meeting water quality objectives of dissolved oxygen, and cost estimates made. Alternative costs of meeting the same objectives by means of advanced effluent treatment alone appear to be several times as great. It is concluded that instream aeration may provide a feasible alternative to advanced waste treatment for polluted rivers, as a supplement to secondary waste treatment. (WRSIC abstract)

PB-192 702
Bureau of Radiological Health, Rockville, Md.
VARIABILITY IN THE AUTOMATIC PROCESSING OF MEDICAL X-RAY FILM,
John P. Fergusen, and Warren W. Schadt. Jun 70, 44p* DEP-70-13

Descriptors: (*Photographic film, Processing), (*X-ray photography, Photographic film), Automation, Medicine, Diagnostic agents, Radiography, X rays, Health physics, Public health, Periodic variations.

Equally exposed films were developed in 26 automatic processors. Films were developed in 22 of these processors, one film per week for 3 consecutive weeks. The percent standard deviations of the film base-fogs, relative speeds, and average gradients were respectively 18, 12, and 4 percent. Films were developed in the other four processors on a daily basis for one-month period. During this time, two of the processors required major servicing because of mechanical and chemical malfunctions. The percent standard deviations of the base-fog for the films developed in these two processors were 39 and 51 percent. For the other two processors, the percent standard deviations in the base-fog were both 11 percent. (Author)

PB-192 748
Bureau of Radiological Health, Rockville, Md.
NEAR FIELD INSTRUMENTATION,
A. W. Rudge, and R. M. Knox. Jul 70, 80p DEP-70-16
Grant PHS-CPE-R-69-23

Descriptors: (*Electromagnetic fields, Measurement), (*Probes (Electromagnetic), Design), Nondestructive testing, Electromagnetic waves, Diodes (Semiconductor), Calibration.

A near-field probe for measuring electromagnetic radiation was developed. The probe employs diode detectors and is designed to minimize interactions with the field being measured. This report discusses the problems associated with measuring electromagnetic radiation and describes the design, construction, and calibration of the prototype probe. (Author)

PB-192 760
Washington Univ., Seattle. Dept. of Civil Engineering.
PLANKTON COMMUNITY AND HYDRAULIC CHARACTERIZATION PRELIMINARY TO LAKE FLUSHING.
Final rept.,
Eugene B. Welch, Ronald J. Buchanan, Ronald E. Nece, and Richard H. Bogan. Oct 69, 188p W70-08166, FWQA-16010-10/69

Descriptors: (*Water pollution, Lakes), (*Lakes, Plankton), Nutrition, Control, Distribution, Hydraulic models, Mathematical models, Algae.
Identifiers: *Eutrophication, *Water treatment, *Moses Lake, *Flushing.

The effect was evaluated of adding varying amounts of low-nutrient flushing water to one area of Moses Lake, a 6,500-acre highly eutrophic lake in eastern Washington. Cluster analysis of plankton data identified 6 sample groups and species groups. Temporal and spatial variations in community types and standing crops appear to be related to detention time, nitrate content, and available light. The effect of low-nutrient dilution water on lake plankton growth response indicated growth at 90% and 86% lake water. Dye studies, diurnal plankton sampling, and field observations indicate that southerly winds have a great effect on moving algae upstream into upper Parker Horn. Water movements in the lake could be simulated in a distorted Froude law hydraulic model. Removal of algae and nutrients by flushing procedures in Parker Horn and the lower lake would likely be more effective at night. Moses Lake behaves both biologically and hydraulically as though it were divided into several partially isolated regions. A tentative mathematical model has been set up for simulating the productivity and distribution of algae. Flushing Parker Horn with large slugs of low nutrient water may not be effective because of wind action transporting algae and their entrained nutrients back into the Horn together with nutrient regeneration from sediments. (WRSIC-abstract)

PB-192 764
Robert A. Taft Water Research Center, Cincinnati, Ohio.
A GENERALIZED COMPUTER MODEL FOR STEADY-STATE PERFORMANCE OF THE ACTIVATED SLUDGE PROCESS,
Robert Smith, and Richard G. Eilers. Oct 69, 137p W70-08165, FWQA-17090-10/69

Descriptors: (*Sewage, Mathematical models), Computer programs, Oxidation, Bacteria.
Identifiers: *Activated sludge process, Waste water treatment, Nitrification, Biochemical oxygen demand, Aeration, *Sewage treatment.

Mathematical models used to represent the activated sludge process are examined; means of analysis and computation of the differences and similarities between models are investigated. Two digital computer programs have been developed. The first program, the Continuous Steady State Activated Sludge (CSSAS) is a steady state model of the conventional activated sludge process flexible enough to simulate any of the proposed models. The second digital program Fill and Draw Activated Sludge (FADAS) attempts to simulate the biological activity in a fill and draw bench experiment in which activated sludge is mixed with substrate in any proportions. The FADAS program which has not been validated will be useful in interpretation of bench scale fill-and-draw experiments. The CSSAS program represents the most complete state-of-the-art computational procedure for quasi-steady-state performance of the ac-

tivated sludge process but some important questions relating to design and operation of the process remain unresolved. However, further experimentation should ultimately result in a thoroughly reliable design tool. (WRSIC-abstract)

PB-192 852
New York Univ., Bronx. Dept. of Chemical Engineering.
SPREADING AND MOVEMENT OF OIL SPILLS.
Water pollution control research series,
Henry G. Schwartzberg. Mar 70, 111p*
FWQA-10580-EPL-4/70, W70-08163
Contract FWPCA-01342-01A

Descriptors: (*Water pollution, *Petroleum), Water waves, Drift, Wind, Ocean currents, Fuel oil.
Identifiers: *Oil pollution, *Oil slicks, Windward drift, Wind velocity, Spreading.

The spreading and movement of oil spills on water were investigated. Areas for spills which form lenses were measured and correlated. Most crudes tested formed thin films, not lenses; but lens formation could be induced and spreading greatly reduced by surfactant treatment. Spreading rates for small spills were measured and correlated with spill volume, oil density and water viscosity. Field data and energy conservation, however, indicates that these aspects of small spills cannot be scaled up to large spill volumes. Wind-water basin tests indicated that on quiet open water oil should drift windward at 3.66% of the wind velocity. The percentage drift was not significantly affected by oil or water properties, depth, and wind speed, and agrees fairly well with field data. Waves caused significant reductions in wind drift, but in the shallow basin used did not induce significant drift themselves. Since wind causes waves, and deep water waves cause drift, further investigation of wind and wave drift interaction is recommended. Wind drift was found to be confined to a thin surface layer. The use of 1 - 1 1/2 inch deep oil-confining drogues markedly reduced wind drift. Investigation of the use nets of such drogues and of lens formation to reduce oil spread and movement is recommended. (Author)

PB-192 853
Rhode Island Univ., Kingston. Graduate School of Oceanography.
SENSITIVITY OF BENTHIC MICROFLORA TO POLLUTION GRADIENTS.
Final rept.,
Nelson Marshall, Donald M. Skauen, and Candace A. Oviatt. 1970, 70p W70-08164, FWQA-18050-DXU-6/70
Grant FWQA-1WP-01220
Prepared in cooperation with Connecticut Univ., Storrs.

Descriptors: (*Microorganisms, *Ocean bottom), (*Water pollution, Microorganisms), Effectiveness, Ecology, Marine biology, Sedimentation, Production, Temperature, Environment, Tables, Sampling.
Identifiers: *Marine microorganisms, *Benthos, *Food chains.

The objective of the research was to evaluate relationships between the productive condition of the sediment environment and pollution effects normally experienced along a densely populated coastline. Specifically the work was designed to: Improve the methodology for measuring the productivity of the benthic microflora community; Determine the normal rate of productivity of the microflora community of shoal benthic environments, as indicated by the rate of 14 C uptake by intact samples of samples; Compare this norm with productivity in an area affected by heavy domestic pollution and an area affected by thermal addition.

PB-192 887
National Research Council, Washington, D.C. Committees on Pollution Abatement and Control.
ABATEMENT OF SULFUR OXIDE EMISSIONS FROM STATIONARY COMBUSTION SOURCES.

15 Feb 70, 85p* COPAC-2
Contract PHS-CPA-22-69-31

Descriptors: (*Power plants (Establishments), Air pollution), (*Air pollution, *Combustion products), (*Sulfur compounds, Air pollution), (*Electric power production, Predictions), Reviews, Dioxides, Nuclear power plants, Coal, History, Economics.
Identifiers: *Sulfur dioxide, Economic forecasting, *Air pollution control equipment.

The report covers the impact of the nation's growing requirements for electricity upon the sulfur oxide emissions problem and review the possibilities for abatement of sulfur oxide emissions through the widespread use of nuclear power plants, the use of sulfur-free or low-sulfur fuels, and the development and application of technology to control sulfur oxide emissions. A strategy for the research, development, and demonstration of this technology is presented. Appendixes to the report contain lists of organizations that made presentations and correspondents who supplied information for the study, lists of research and development activities in sulfur oxide pollution control in the United States and abroad, and a selective bibliography. (Author)

PB-192 888
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
BREMSSTRAHLUNG PRODUCTION.
David G. Brown. Jul 70, 28p BRH/DEP-70-18

Descriptors: (*Electronic equipment, Radiation hazards), (*Bremsstrahlung, Production), X rays, Electrons, Scattering, Photons.

An understanding of bremsstrahlung production is basic to the understanding of x radiation from electronic products. For this reason the Division of Electronic Products has conducted a bremsstrahlung literature survey and has begun a program of experimental research on bremsstrahlung production. The literature survey revealed severe deficiencies in present knowledge about bremsstrahlung, indicating that the DEP program is urgently needed. (Author)

PB-192 957
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
RADIATION SAFETY SURVEYS OF X-RAY FACILITIES WITHIN THE FEDERAL HEALTH PROGRAMS SERVICE.
Technical rept. Mar 68-Feb 69,
Lois A. Miller, and LaVert C. Seabron. Jul 70, 38p BRH/DEP-70-17

Descriptors: (*X-ray photography, Safety), Radiography, Public health, Hospitals, United States.

A comprehensive survey was performed between March 1968 and February 1969 of the x-ray facilities in 11 Public Health Service hospitals and 20 outpatient clinics throughout the United States. Facility workloads, type of equipment, operator training, and equipment dificiencies were analyzed, and recommendations were made for improved training programs, equipment modifications, and continuing facility surveys at regular intervals. (Author)

PB-193 153
Bureau of Radiological Health, Rockville, Md.
PROPERTIES OF LIQUID CRYSTALS AND THEIR APPLICATION TO THE MEASUREMENT OF MICROWAVES AND INFRARED RADIATION.
14 Mar 69, 27p* Seminar paper-009
Presented at National Center for Radiological Health's Seminar Program, Rockville, Md., 14 Mar 69.

Descriptors: (*Detectors, Liquids), (*Infrared detectors, Liquids), Reviews, Microwaves, Crystals, Cholesteryl esters, Imines, Colors, Electric fields, Heat.
Identifiers: *Liquid crystals, Nitro compounds, *Microwave radiation hazard detectors.

Molecular geometry is shown to be important in interpreting the properties of thermotropic liquid crystals. The present 'state of the art' is discussed and a description of how one can build molecules which will possess certain properties needed for specific applications is included. Certain aspects of molecular geometry are considered. Optical and structural properties of the different types of liquid crystals are explained with an emphasis on the use of these properties in the practical applications of liquid crystals. Both thermotropic and lyotropic liquid crystals are included in these deliberations. Applications of liquid crystals are directly related to the use of cholesteric esters which show color change as a function of temperature. Brief mention is made of the use of neumatic liquids which show strong response to electric and magnetic fields. (Author)

PB-193 223
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
INVESTIGATION OF THE RESPONSE OF THE MICROLITE 287 PROBE TO MICROWAVE FIELDS.
Herbert F. Kein, Mays L. Swicord, David G. Brown, and Robert L. Moore. Aug 70, 54p BRH-DEP-70-20

Descriptors: (*Cooking devices, Microwaves), (*Leakage (Electrical), Detection), (*Probes (Electromagnetic), Performance (Engineering)), Radiofrequency power, Mercury, Neon, Autoignition.
Identifiers: Microlite 287 probes, *Microwave ovens.

The report describes tests performed on the Microlite 287 microwave oven leakage probe under laboratory and field simulated conditions. The probe contains a preignited mercury-neon gas which ionizes and glows in the presence of radiofrequency energy. The probe-to-probe variability and the difficulty encountered in observing the change in glow intensity seriously limit the usefulness of the probe as a measurement device. It may be useful as a device for detecting gross microwave oven leakage. (Author)

PB-193 348
Bureau of Radiological Health, Rockville, Md.
A COMPREHENSIVE BIBLIOGRAPHY OF ELEMENT 44, RUTHENIUM.

1970, 1956p* BRH/CFS-70-1
Includes Section 1A thru Section 4, Appendix A thru Appendix C.6. Availability: 16mm microfilm only after stock exhausted.

Descriptors: (*Ruthenium, *Bibliographies), (*Radiological contamination, Ruthenium), Radioactive waste, Complex compounds, Ruthenium compounds, Water pollution, Indexes, Metabolism, Toxicity, Chemical reactions, Radiobiology.

The bibliography enumerates those papers in the open scientific literature through 1963 that deal with ruthenium, and represents a practical attempt to completely record the literature dealing with ruthenium. References are included that report relevant biological, chemical, and physical properties of the metal, its many chemical compounds, or

its complexes. The report is arranged in four major parts: Index in which keywords-in-context (KWIC Index) from each title have been arranged alphabetically down the center of the column; Bibliographic citations arranged alphabetically by last name of principal author; Cross-index of all author names arranged alphabetically for all references cited; and Cross-index containing more than 200 U.S. and foreign patents related to uses of ruthenium and offering direct access to the patent literature citations. (Author)

PB-193 417
Marquardt Co., Van Nuys, Calif.
STUDY OF CONTINUOUS FLOW COMBUSTION SYSTEMS FOR EXTERNAL COMBUSTION VEHICLE POWERPLANTS.
Final rept.,
C. V. Burkland, W. B. Lee, G. Bahn, and R. Carlson. Jun 70, 168p* APTD-0574
PHS-CPA-22-69-128

Descriptors: (*External combustion engines, *Air pollution), Exhaust gases, Combustion deposits, Fuel injectors, Combustion chambers, Heat exchangers, Test methods, Sampling, Samplers, Gas analysis, Rankine cycle, Design.

Chemical kinetic studies were employed to better understand how and at what rate air pollutants are formed in an external combustion process. With this background, an experimental combustion test rig employing a recirculating step, staged burner was built. Tests were conducted with various liquid and vaporized liquid fuel injectors using aviation turbine fuel (Jet A) and 2,2,5-trimethylhexane. A wide range of fuel-air ratios were examined by individually controlling primary and secondary air flow rates. Fuel flows were varied from a maximum corresponding to a heat release of 500,000 BTU/hr to 1/30 of this value. Two runs were also made using gaseous methane fuel. The range of test variables were: injector configurations - pressure atomizing, vaporizing, 2nd vaporizing premixed; fuel flows from 0.15 to 4.5 gallons per hour; air flows from 3.4 to 103 standard cubic feet per minute; fuel equivalence ratio - primary from 0.53 to 1.59, and overall from 0.40 to 0.84; number of test conditions - 140; and cumulative combustion time - 22 hours. The tests demonstrated that gaseous and particulate emissions less than those established as the 1980 Federal Research goals can be achieved simultaneously in a high heat release, low pressure drop, burner configuration. The emission data measured at steady state conditions is compared to current and future emission goals for automobiles. (Author)

PB-193 418
Thermo Electron Corp., Waltham, Mass.
CONCEPTUAL DESIGN, RANKINE-CYCLE POWER SYSTEM WITH ORGANIC WORKING FLUID AND RECIPROCATING ENGINE FOR PASSENGER VEHICLES,
Dean T. Morgan, and Robert J. Raymond. Jun 70, 237p* TE4121-133-70
Contract PHS-CPA-22-69-132

Descriptors: (*External combustion engines, *Rankine cycle), (*Passenger vehicles, External combustion engines), Internal combustion engines, Performance (Engineering), Statistical analysis, Fuel consumption, Combustion chambers, Automatic transmissions, Regenerative cooling, Condensers (Liquefiers), Exhaust gases, Cost effectiveness, Thiophenes, Rotary seals, Air pollution, Reduction.
Identifiers: Rankine cycle engines, Organic ranking cycle engines, Automobile engines.

A conceptual design was prepared of a Rankine-cycle power system with organic working fluid and reciprocating engine for a low-emission automotive propulsion powerplant. The goal of the study was development of a system competitive in cost, performance, and driver convenience with the internal combustion engine system using current technology wherever possible. The component designs and characteristics are presented. The complete 100 net shaft horsepower system is packaged in the engine compartment of a late model sedan; the predicted performance characteristics are presented. The system is closely competitive, in 0 - 60 mph acceleration time and in level-grade top speed, with a 302 cubic inch displacement internal combustion engine with three-speed transmission. The fuel economy in customer-average mpg is approximately 20% less than the 302 cubic inch internal combustion engine. The use of thiophene as a working fluid, with a moderate maximum cycle temperature of 550F, permits a significant cost reduction relative to the equivalent steam system. Projection of current burner data indicates a strong potential for emission levels significantly less than the projected 1980 federal standards for all three of the major pollutants: unburned hydrocarbons, carbon monoxide, and nitric oxide. (Author)

PB-193 420
General Technologies Corp., Reston, Va.
STUDY OF COST OF SULPHUR OXIDE AND PARTICULATE CONTROL USING SOLVENT REFINED COAL,
Robert G. Shaver. Apr 70, 72p* APTD-0575
Contract PHS-CPA-22-69-82

Descriptors: (*Air pollution, *Combustion products), (*Coal, Air pollution), (*Sulfur, *Reduction (Chemistry)), Separation, Chemical engineering, Costs, Economics, Organic solvents.
Identifiers: *Sulfur dioxide, *Desulfurization, Solvent refining, Bituminous coal.

The primary purpose was to display the cost analysis data in such a way that it is readily adaptable to a large variety of real or hypothetical situations of heat or power generation so that direct comparisons can be made of the pollution control cost in specific situations by the use of solvent refined coal to that of any other projected system for which control cost information is available. The heat content of SRC is considerably higher than the coal from which it is made and hence shipping costs are lower on an equivalent thermal basis. This is approximately 16,000 Btu/lb, which exceeds high quality anthracite or bituminous coal. Combustion chamber corrosion and slagging problems are directly reduced by its use. Since solvent refined coal can be liquified by heating and/or increasing its residual solvent oil content, there exists the option of firing as solid coal or as fuel oil. Lastly it is essentially a 'fail-safe' pollution control process so far as the combustion unit is concerned, since no unusual SO2 pollution can be emitted due to breakdown or bypassing of equipment, as could occur with processes that cleanse combustion products. The potential market for solvent refined coal is difficult to predict largely because its use requires a long-term commitment on the part of producers to process it and on the part of the users, primarily the electric power utilities, to consume it. A level of production necessary for economy requires this. A processing cost of no more than 10 cents/MMBtu to convert bituminous coal to SRC should allow price-competitive access to over 60% of the current bituminous coal-fired combustion unit market. (Author)

PB-193 479
Williams Research Corp., Walled Lake, Mich.
EXHAUST EMISSIONS FROM WILLIAMS RESEARCH CORPORATION GAS TURBINE ENGINES.
Interim rept. 18 Jun 69-18 Apr 70,
H. B. Moore, and J. A. Royer. 18 Jun 70, 92p* WR-ER8 APTD-0577
Contract PHS-CPA-22-69-84

Descriptors: (*Air pollution, *Exhaust gases), (*Gas turbines, Exhaust gases), (*Turbojet engines, Exhaust gases), (*Turbofan engines, Exhaust gases), Carbon monoxide, Nitrogen oxides, Hydrocarbons, Monitors, Combustion, Test methods.
Identifiers: *Air pollution detection, JP-4 fuel.

The exhaust emissions of several different models of gas turbine engines under development or in production were measured. The emissions measured were carbon dioxide, carbon monoxide, unburned hydrocarbons, and the oxides of nitrogen. The results are presented in a generalized form relating emissions to fuel air ratio and engine power or thrust. Techniques were developed to convey exhaust samples from engines in test cells to analysis equipment located elsewhere. Measurements were also made of the emissions from a gas turbine engine installed in a vehicle. Gas turbine engines are inherently low polluters in carbon monoxide and unburned hydrocarbons compared to other types of engines of the same power output. Transient engine operation produces many times the CO and hydrocarbon emission that steady state operation produces. Part load engine operation produces more CO and hydrocarbon emission than full load. The opposite is true of the oxides of nitrogen. The oxides of nitrogen are the most serious emission problem of gas turbine engines with respect to proposed emission controls. Satisfactory methods have been developed in this program for sampling exhaust pollutants from a variety of gas turbine engines. A heated sampling system is necessary to prevent deterioration of the unburned hydrocarbon sample between engine and analyzer. (Author)

PB-193 480
National Air Pollution Control Administration, Raleigh, N.C.
AIR POLLUTION INJURY TO VEGETATION.
Environmental health series: air pollution,
Ibrahim Joseph Hindawi. 1970, 49p NAPCA-Pub-AP-71
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25 as HE20.1309:71.

Descriptors: (*Air pollution, *Plants (Botany)), (*Ozone, Plants (Botany)), (*Ethylenes, Plants (Botany)), (*Fluorides, Air pollution), (*Chlorine, Air pollution), Vegetables, Fruits, Aerosols, Organic nitrogen compounds, Sulfur compounds, Peroxides, Tobacco, Photosynthesis, Damage, Health physics.
Identifiers: *Sulfur dioxide, *Peroxyacetyl nitrate.

The effects of air pollutants on vegetation are summarized with the aid of many full color photographs. The contents of this publication are: Structure and Activities of Plants; Photochemical Reaction of Hydrocarbons and Nitrogen Oxides Produces Ozone and Pan; Nitrogen Dioxide Causes Direct Vegetation Damage; Sulfur Dioxide Causes Acute and Chronic Injury; Synergistic Effect of Ozone and Sulfur Dioxide Can Cause More Severe Injury than Either Pollutant Alone; Plant Damage Appears from Low Concentration of Fluorides; Chlorine Damage Occurs Close to Source; Ethylene Injures Vegetation in Urban Areas; Air Pollution Retards Growth of Vegetation; Vegetation Injury from Other Agents Can be Confused with Air Pollution Injury; and Air Pollution Injury to Vegetation Indicates Degradation of Environment. (Author)

PB-193 483
Callery Chemical Co., Pa.
SULFUR RECOVERY FROM FLUE GAS VIA REVERSIBLE DRY ABSORBENT.
Summary rept. 20 Jun 68-19 Jun 69.

1969, 82P* CCC-69-31 APTD-0578
Contract PH-22-68-40

Descriptors: (*Waste gases, *Adsorption), (*Air pollution, *Sulfur compounds), (*Wastes (Industrial), Recovery), (*Sulfates, Adsorption), Oxides, Oxidation, Fluidized bed processes, Catalysts, Sodium compounds, Vanadium compounds, Economics, Sulfuric acid.
Identifiers: *Sulfur trioxide, *Sulfur dioxide, *Waste gas recovery, *Sodium sulfates, Desorption, Vanadium pentoxide.

The feasibility was studied of a process for removal of sulfur oxides from flue gas using a reversible dry absorbent. Sulfur dioxide in the flue gas is first oxidized to SO3 and then absorbed on a fluidized solid. The sorbent consists of Na2SO4 impregnated on an inert carrier and takes up SO3 through the formation of sodium pyrosulfate. Oxidation of SO2 was not studied, however, catalytic oxidation was used to prepare an SO3 feed stream for the experimental program. An experimental program was carried out to develop kinetic and equilibrium data for the reaction of Na2SO4 supported on silica gel with SO3. The data were obtained under conditions suitable for a cyclic absorption and desorption process. Nitrogen oxides and water vapor in the concentration normally found in flue gas were found to have little effect on the SO3 absorption rate. Desorption of SO3 at a concentration of 6% in the gas was found to be very rapid at 930 F, and essentially quantitative recovery of SO3 was obtained at 1020 F. A process design was developed based on the reaction rates and temperature conditions determined in the experimental program. Economic studies pointed up the importance of using an inexpensive catalyst and sorbent and minimizing the loss of these materials. Therefore, the concept of using a combined catalyst and sorbent consisting of fly ash impregnated with V2O5 and Na2SO4 was developed. Preliminary experiments carried out using a fly ash based catalyst and fly ash sorbent were promising. The desorbed SO3 can be absorbed in sulfuric acid to produce concentrated H2SO4 or oleum for sale, or by maintaining a slightly reducing atmosphere in the desorber, a concentrated stream of SO2 (44%) can be produced. The estimated capital and operating costs show that the process is competitive with alternative processes. (Author)

PB-193 486
Bituminous Coal Research, Inc., Monroeville, Pa.
AN EVALUATION OF COAL CLEANING PROCESSES AND TECHNIQUES FOR REMOVING PYRITIC SULFUR FROM FINE COAL.
Interim rept.

Sep 69, 279p* BCR-L-339
Contract PH-86-67-139
See also PB-193 484.

Descriptors: (*Coal, *Purification), (*Sulfur compounds, Coal), (*Pyrites, Coal), Air pollution, Organic compounds, Flotation (Separation), Particle size, Calcification.
Identifiers: *Coal (Low sulfur), *Benefication.

During the combustion of fossil fuels, sulfur oxide compounds are formed and released to the atmosphere. If it were feasible to physically remove pyrite from coal in significant quantities, the amount of sulfur oxide produced from coal firing could be reduced. The objective of the work was twofold; first, to extend the washability data to finer sizes of coal, and second, to evaluate coal cleaning methods and techniques for removing pyritic sulfur from the fine-sized coal. From previous work with pyrite removal from finely sized coal, two size consists were of interest in the washability studies: The 30 mesh x 0 size; and Each coal's 'as fired,' or p.c. grind. During evaluation of the pyrite liberation and removal characteristics of seventy different utility coals when pulverized to a topsize of 30 mesh and to the coal's p.c. grind, an extensive quantity of information has been generated. The results of the coal cleaning tests with the concentrating table were, in general, excellent. A wide range in sulfur reduction was obtained in the Majac air classification tests. (Author)

PB-193 487
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
EVALUATION OF AN X-RADIATION DOSIMETRY SERVICE FOR HOME TELEVISION RECEIVERS,
Charles P. Warr. Aug 70, 24p* BRH/DEP-70-21

Descriptors: (*Television receivers, *Radiation hazards), (*Dosimeters, Television receivers), Measurement, Radiological dosage, X rays, Color television.
Identifiers: Ray Alert dosimeters.

An analysis and evaluation of the consumer oriented, television x-radiation dosimetry system, Ray-Alert, was performed. Detailed attention was given to statistical analysis in order to specify the test conditions as rigidly as possible. The results are summarized, taking into account the capability of the dosimetry service and its application to the measurement of x radiation from television receivers. (Author)

PB-193 522
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
REPORT OF TESTS FOR X-RAY EMISSION FROM A RAYOTRON ELECTROSTATIC GENERATOR AND PARTICLE ACCELERATOR,
Edwin A. Miller. Aug 70, 28p BRH/DEP-70-22

Descriptors: (*Electrostatic generators, Radiation hazards), (*Radiation hazards, *X rays), Van de graaff generators, Safety, Particle accelerators, X-ray spectrum.

The report describes a study undertaken by the Product Testing and Evaluation Branch to evaluate the radiation hazards associated with a small electrostatic generator and particle accelerator used for educational purposes. Laboratory measurements of the x-ray emission are presented, and comments are offered regarding the safety instructions provided with the device. Test findings are compared to the purposed performance standard for demonstration-type cold-cathode gas discharge tubes, since the final version of the standard had not been published at the time the work was performed. (Author)

PB-193 542
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
A PARTIAL INVENTORY OF MICROWAVE TOWERS, BROADCASTING TRANSMITTERS, AND FIXED RADAR BY STATES AND REGIONS.
Jun 70, 47p* BRH/DEP-70-15
Prepared in cooperation with Electromagnetic Compatibility Analysis Center, Annapolis, Md.

Descriptors: (*Radiation hazards, Microwave equipment), (*Antennas, Inventory), United States, Microwave communication systems, Radar, Radio broadcasting.

The report inventories a small segment of the devices used in the electromagnetic spectrum and indicates their widespread usage. It further indicates the large amount of computerized information, in various files, which is available. Lastly, an appendix provides the reader with a summary of potential biological hazards to man from the many devices used in communications, detection, measurement, medicine, and other fields. (Author)

PB-193 565
Southwestern Radiological Health Lab., Las Vegas, Nev.
LASER FUNDAMENTALS AND EXPERIMENTS.
Technical rept.,
W. F. VanPelt, H. F. Stewart, R. W. Peterson, A M. Roberts, and J. K. Worst. May 70, 24p
BRH/SWRHL-70-1

Descriptors: (*Lasers, *Manuals), Theory, Optics, Gas lasers, Safety, Radiobiology, Scattering, Electron transitions.
Identifiers: *Holography.

The manual was prepared in response to the increasing use of lasers in high schools and colleges. It is directed primarily toward the high school instructor who may use the text for a short course in laser fundamentals. The definition of the laser, laser operation, properties of laser light, biological effects of laser light, laser applications, safety in classroom laser use, and experiment section (equipment necessary for experiments) are included in this manual. This manual is written in a manner to give an intuitive understanding of the device and its inherent properties.

PB-193 727
Uniroyal, Inc., Wayne, N.J. Research Center.
DEVELOPMENT OF REGENERABLE FIBERS FOR REMOVAL OF SULFUR DIOXIDE FROM WASTE GASES.
Final rept. 1 Jul 68-26 Aug 69,
Ronald W. Fuest, Merlin P. Harvey, C. W. Lee, and S. A. Black. Jul 70, 106p* APID-0584
Contract PH-86-68-74
See also PB-185 093.

Descriptors: (*Air pollution, *Sulfur compounds), (*Gas filters, Waste gases), (*Adsorption, *Waste gases), Economics, Dioxides, Control, Styrene plastics.
Identifiers: *Air pollution control equipment, *Sulfur dioxide, Desorption, Poly ((maleimidediyl/N- (dimethylamino)propyl)- (ethylene/phenyl)), Styrene copolymers, Polymaleimides, Polypropylene, Regeneration (Engineering), Poly (imino-ethylene).

Fibers comprised of a blend of resin and a polymer which contains basic nitrogen groups were prepared and evaluated as sorbents for removing SO2 from waste gases. The effect of such variables as temperature, moisture, loading of sorbent, fiber denier, and SO2 concentration in the gas stream were studied. The chemistry and mechanism of the sorption and regeneration processes were elucidated. Preliminary economic and engineering analyses were performed. (Author)

PB-193 799
Delaware River Basin Commission, Trenton, N.J.
DELAWARE ESTUARY AND BAY WATER QUALITY SAMPLING AND MATHEMATICAL MODELING PROJECT.
Final progress rept. 1 Jul 67-31 Jan 69.

May 70, 114p FWQA-16090-DEL-5/70, W70-09526
Prepared in cooperation with Rutgers - The State Univ., New Brunswick, N.J.

Descriptors. (*Water pollution, *Estuaries), (*Delaware Bay, Water pollution), Mathematical models, Bays, Oxygen, Standards, Chlorides, Metals, Nitrates, Phosphates, Salinity, Sampling, Hardness.
Identifiers: Biochemical oxygen demand, Water quality.

The principal contents of the report are comparisons of water quality parameters for the Delaware Estuary with those previously estimated for years ending 1963. Data on water quality were also obtained for a number of major pollution sources. Comparisons show that previous mathematical models for the Delaware Estuary can still be used to verify dissolved oxygen levels. Current levels of dissolved oxygen fail to meet the standards established by the Commission. It is stated that in the future, regulation of carbonaceous raw waste of industry and municipalities will be sufficient to meet these standards, but no basis for this prediction is outlined in the report. The report provides background for further analysis of economically feasible alternatives programs on the Delaware River. (WRSIC abstract)

PB-193 801
Center for the Environment and Man, Inc., Hartford, Conn.

LONG-TERM EFFECTS ON AIR POLLUTION - A SURVEY,
G. D. Robinson. Jun 70, 50p* CEM-4029-400 APID-0585
Contract PHS-CPA-22-69-155

Descriptors: (*Air pollution, *Climatology), (*Bioclimatology, Air pollution), (*Precipitation (Meteorology), Air pollution), (*Carbon dioxide, Air pollution), (*Carbon monoxide, Air pollution), (*Sulfur dioxide, Air pollution), (*Nitrogen oxides, Air pollution), Life cycles, Ecology, Spaceborne detectors, Climate changes, Monitors, Condensation nuclei.
Identifiers: Air pollution detection.

The need for research into the long-term geophysical and biological effects of air pollution is assessed. The problem areas are surveyed and the lines on which useful research could be pursued are broadly delineated. The report contains sections on: the major pollutants - their emission and role in the atmosphere; climate, climatic change, and theories of climate; transport of pollutants in the context of long-term effects; pollutants and cloud condensation processes; the biosphere and long-term effects of air pollution; and monitoring. (Author)

PB-193 804
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
MICROWAVE OVEN TEST LOAD EVALUATION AND DETERMINATION OF INTERNAL MICROWAVE ENERGY DISTRIBUTION,
Harry Levine, and Robert L. Moore. Aug 70, 34p* BRH/DEP-70-23

Descriptors: (*Ovens, *Microwave equipme (*Leakage, Microwaves), Tests, Cobalt halides. Sponges (Materials).
Identifiers: *Microwave ovens, Cobalt chlorides, Microwave radiation leakage.

A study was made to investigate the variables that must be considered in any test procedure used to measure radiation leakage from microwave ovens. An evaluation was made of the effect of various factors involved in such measurements, including load temperature, size and shape of containers for the load, water load repeatability, and the suitability of loads other than water. A study was also made of the distribution of microwave patterns in an oven using sponge substrate impregnated with hydrated cobaltous chloride. The chemically impregnated sponge test could be a very helpful aid in determining the test load position in order to create the condition of worst possible leakage from a microwave oven. (Author)

PB-193 898
Bureau of Radiological Health, Rockville, Md.
BIOLOGICAL EFFECTS AND HEALTH IMPLICATIONS OF MICROWAVE RADIATION,
Stephen F. Cleary. Sep 69, 269p BRH/DBE-70-2
Proceedings of Symposium held at Richmond, Va., 17-19 Sep 69.

Descriptors: (*Radiation effects, *Microwaves), (*Health physics, Microwaves), (*Meetings, Microwaves), Central nervous system, Cataracts, Eye, Radiation hazards, Radio waves, Heat, Effectiveness.

Microwave generating devices have become increasingly prevalent and diverse in recent years. Their use is expected to continue to grow. Although there has been an awareness of the biological effects that can result from exposure to microwaves, there still exists a paucity of information and some controversy concerning the biological effects of these radiations. This Symposium was held to provide an indication of the present state of knowledge in the area of microwave health effects. The Proceedings are a compilation of the 31 technical papers presented, the deliberations that followed each one, and the two panel discussions that concluded the meeting. (Author)

PB-193 939
Federal Water Quality Administration, Washington, D.C.
COMBINED SEWER OVERFLOW ABATEMENT TECHNOLOGY.
Jun 70, 330p FWQA-11024-06/70 W70-09558
Symposium on Storm and Combined Sewer Overflows Held at Chicago, Ill. on 22-23 Jun 70. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.50 as 167.13/4:11024.

Descriptors: (*Water pollution, Abatement), (*Sewage treatment, Regulators), (*Storm sewers, Water pollution), Abatement, Urban areas, Erosion, Land use, Surface water runoff, Reports, Meetings.

The compilation of papers contains results of the current demonstration grants and contracts that are being supported by the FWQA. The papers discuss: (1) alternatives to storm and combined sewer pollution in a small urban area; (2) screening and air floatation for solids removal; (3) underflow deep tunnel system concept; (4) urban erosion and sediment control; (5) sewer monitoring and remote control; (6) combined sewer overflow regulators; (7) use of fine mesh screens; and (8) land use and urban runoff pollution. (WRSIC abstract)

PB-194 032
Rand Development Corp., Cleveland, Ohio.
RAPID-FLOW FILTER FOR SEWER OVERFLOWS.
Water pollution control research series.
Aug 69, 69p* FWPCE-DAST-25 W70-09741, FWQA-11023-DPI-08/69

Descriptors: (*Storm sewers, Overflows), (*Sewage filtration, Coal), Feasibility studies, Sanitary engineering, Solids, Cost effectiveness, Site surveys, Urban planning, Particle size, Ohio.
Identifiers: Filter beds, *Rapid flow filters, *Cleveland (Ohio).

In a pilot installation up to about 65% of solids from overflows of combined sewer systems were removed by using lump coal as a rapid-flow filter. The lump coal was sized to three-fourths by one and one-fourth inches, free of fines, and about eight inches in depth. The overflow is directed onto the filter bed in such a manner that the filter bed is not displaced. When plugged, or upon a routine basis, the filter bed is replaced; the spent bed, composed of coal and solids, is incinerated or landfilled or disposed of by whatever manner is locally in use which does not pollute the atmosphere or surface or underground waters. The potentially most valuable contribution in the work was the finding that conventional sewage sampling does not provide a representative indication of the nature of large solids content. A recommendation for an improved sampling procedure is made.

PB-194 064
Scott Research Labs., Inc., Plumsteadville, Pa.
1969 ATMOSPHERIC REACTION STUDIES IN THE LOS ANGELES BASIN. VOLUME IV. AIRBORNE DATA ESSA COOPERATIVE DATA.
Final rept. 18 Aug-14 Nov 69.

16 Feb 70, 308p
Contract PHS-CPA-70-6
Sponsored jointly by Coordinating Research Council, Inc., New York. See also Volume 1, PB-194 061.

Descriptors: (*Air pollution, *Smog), (*Meteorological data, Air pollution), Tables (Data), Airborne detectors, Monitors, Wind (Meteorology), Concentration (Composition), Ultraviolet radiation, Humidity, Aldehydes, Ozone, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Urban areas.
Identifiers: *Los Angeles (California), *Air pollution detection, Peroxyacetyl nitrate.

The report contains data for the chemical and meteorological parameters measured aloft during the 26 aircraft flights and for analyses performed on the Tedlar bag samples collected during vertical profiles. The data from the continuous instruments were recorded at ten second intervals during profiles and at one minute intervals at other times. Occasional spurious readings, usually caused by interfering signals, must be disregarded. The first four flights were made before all the instrumentation was operational and were used for check-out purposes. Asterisks are placed between the UV columns when the aircraft was in level flight. Other UV readings are not necessarily valid. Altitudes recorded by the transducer have been corrected for barometric pressure and instrument error by empirical equations, and most residual errors are less than 50 feet. (Author)

PB-194 065
Utah Water Research Lab., Logan.
DEVELOPING A HYDRO-QUALITY SIMULATION MODEL,
Neal P. Dixon, David W. Hendricks, A. Leon Huber, and Jay M. Bagley. Jun 70, 199p PRWG-67-1 W70-09740, FWQA-16090-DWR-06/70
Paper copy also available from Utah State Univ., Utah Water Research Lab., Logan, Utah 84321. $2.50.

Descriptors: (*River basins, Models), (*Water use, Simulation), Computer programming, Water quality, Water pollution, Water treatment, Dams, Dissolved gases, Systems analysis, Biochemical oxygen demand, Salinity, Fluid flow, Water law, Temperature, Data processing systems, Ground water.

The development of a river basin simulation model comprising dissolved oxygen, temperature, specific electrical conductance, and basin hydrology submodels is demonstrated. The system model is the device for studying practical questions involving some measure of efficiency whether this be pollution minimization by treatment and flow regulation, maximizing water use with the quality constraint, maximizing economy efficiency, or in developing more comprehensive water laws. These questions can be ascertained by simulation of altered conditions, sensitivity analysis, or some optimization technique. Although the model in this report was developed for a specific prototype system, the Little Bear River in Utah, the approach, the methods and the conceptual framework can be transferable to other systems.

PB-194 136
National Air Pollution Control Administration Technical Center, Durham, N.C.
INFRARED SPECTROSCOPIC STUDY OF GAS-SOLID INTERACTIONS.
Final rept.,
Edwin F. Rissmann. Apr 70, 87p* APTD-0586
Contract PHS-CPA-22-69-59

Descriptors: (*Air pollution, *Sulfur dioxide), (*Adsorption, Sulfur dioxide), (*Adsorbents, *Limestone), (*Infrared spectroscopy, Adsorption), Solutions, EDTA, Heavy water, Potassium bromide, Silicates, Roasting, Oxidation, Reaction kinetics, Sulfates, Magnesium oxides, Hydration, Calcium oxides, Carbonates, Dolomite (Rock).
Identifiers: *Gas surface interactions, *Air pollution control, Matrix isolation techniques.

The aim of the reported research was to apply infrared spectroscopic methods to handle large numbers of process control samples and to obtain kinetic information to evaluate the effects of variables such as sulfur dioxide concentration on overall process efficiencies and to understand the deadburning phenomenon associated with limestone processes for removal of sulfur dioxide from flue gases. Major effort was directed toward development of rapid reliable methods for analysis of reacted limestones. A solvent system, suitable for dissolving limestone and capable of being

made infrared inactive by the dual cell technique was developed. The system--tetrasodium EDTA (ethylenediaminetetraacetic acid) saturated water was found to be the only one of a large number of systems investigated capable of dissolving limestone. The feasibility was studied of using a D2O based solvent system to determine the oxide and hydroxide contents of reacted limestones. The KBr pellet technique was studied in considerable detail. Ion exchange resin techniques were also studied in conjunction with the KBr method. Infrared spectroscopic techniques were also applied to studies of gas-solid interactions between the sulfur dioxide content of a simulated flue gas and various limestone absorbents and to an investigation of the deadburning phenomenon. The latter has revealed the strong possibility of chemical reactions with silicate impurities during high temperature calcination. Electron microprobe data has revealed that at lower calcination temperature, all of the silicates are present in discrete phases in the limestone. Studies were also performed to confirm the hydration of MgO in calcined, slaked dolomitic materials. (Author)

PB-194 145
Olson Labs., Inc., Dearborn, Mich.
REPORT ON THE DETERMINATION OF MASS EMISSIONS FROM TWO-CYCLE ENGINE OPERATED VEHICLES.
H. J. Wimette, and R. T. VanDerveer. 23 Jan 70, 77p*
Contract PHS-CPA-22-60-91

Descriptors: (*Air pollution, *Exhaust gases), (*Spark ignition engines, Air pollution), (*Motorcycles, Air pollution), Two stroke cycle engines, Carbon monoxide, Carbon dioxide, Hydrocarbons, Nitrogen oxide (NO), Nitrogen dioxide, Infrared spectroscopy, Ultraviolet spectroscopy, Gas chromatography.
Identifiers: *Air pollution detection.

Two-cycle spark ignited motorcycle engines are evaluated for exhaust emissions from the standpoint of both concentration (percent) and mass (gms/mile) according to current and projected Federal Testing Procedures for light duty vehicles (under 6,000 pound GVW). Seven two-cycle and one four-cycle motorcycle were tested for carbon monoxide, carbon dioxide, hydrocarbons, nitrogen oxide and dioxide using non-dispersive infrared, non-dispersive ultra-violet, flame ionization and gas chromatographic analytical techniques. The inconsistencies in the test method as applied to motorcycles are pointed out and suggestions are made for further studies. (Author)

PB-194 152
National Air Pollution Control Administration, Raleigh, N.C.
LARGE POWER PLANT EFFLUENT STUDY (LAPPES). VOLUME 1. INSTRUMENTATION, PROCEDURES, AND DATA TABULATIONS (1968),
Francis A. Schiermeier, and Lawrence E. Niemeyer. Jun 70, 418p NAPCA-APTD-70-2

Descriptors: (*Air pollution, *Combustion products), (*Electric power plants, Air pollution), (*Climatology, Air pollution), (*Meteorological data, Air pollution), Tables (Data), Thermal power plants, Coal, Sulfur dioxide, Meteorological instruments, Airborne detectors, Plume detection, Meteorological balloons, Radiosondes, Topography, Atmospheric circulation, Pennsylvania.
Identifiers: *Air pollution detection.

The Large Power Plant Effluent Study (LAPPES) was initiated in Western Pennsylvania to evaluate the extent and effects of air pollution resulting from the largest complex of coal-burning generating stations in the United States. During 1968 four series of field experiments were conducted in an area surrounding the Keystone Generating Station; these experiments consisted of ground-based and air-borne plume measurements supported by extensive meteorological observations. Part 1 describes the topography and climatology of the generating station complex, the sulfur dioxide and meteorological monitoring equipment, and experiment operating procedures. Part 2 presents tabulations of plant operational parameters and air quality and meteorological data collected during 1968. Analyses of the data, evaluation of existing plume rise and dispersion theories, or development of new diffusion models are not presented here. (Author)

PB-194 196
Air Preheater Co., Inc., Wellsville, N.Y.
EVALUATION OF FABRIC FILTER AS CHEMICAL CONTACTOR FOR CONTROL OF SULFUR DIOXIDE FROM FLUE GAS.
Final rept. 20 Jun 68-31 Dec 69,
Han Liu, and Robert Chaffee. 31 Dec 69, 179p
Contract PH-22-68-51

Descriptors: (*Air pollution, *Sulfur dioxide), (*Air pollution control equipment, *Contractors), (*Adsorption, Sulfur dioxide), (*Bicarbonates, *Adsorbents), (*Dolomite (Rock), Adsorbents), Chemical engineering, Air filters, Fly ash, Sodium carbonates, Temperature, Combustion products, Nitrogen oxides.
Identifiers: *Air pollution control.

The sorption of SO2 by sodium bicarbonate, nahcolite, hydrated dolomitic lime, promoted hydrated dolomitic lime, and hydrated lime was studied using a full scale pilot fabric filterhouse as the chemical contactor under various operating conditions. A total of 62 tests was performed to determine the effects of sorbent stoichiometric ratio, operating temperature, flue gas flow rate (filter ratio), mode of house operation, method of sorbent feeding and sorbent retention time. For the experiments conducted, gas temperatures ranged between 270F and 640F; flow rates between 7,500 ACFM and 15,000 ACFM; sorbent to SO2 stoichiometric ratios from 0.75 to 3.4 and sorbent retention time from 2.5 seconds to 6 seconds. Tests were also conducted to determine how much of the SO2 removal was taking place while the sorbent was in suspension and how much was taking place in the filtercake on the bags. Measurements of NO2 were also made during the tests. It was definitely shown that the fabric filter can perform adequately as an effective chemical contactor for removal of SO2 from the flue gas as well as a control device for flyash. Of the various filterhouse operating parameters tested, the operating temperature and the stoichiometric ratio have the strongest effect on SO2 conversion efficiency. (Author)

PB-194 241
Union Carbide Corp., Tonawanda, N.Y. Linde Div.
INVESTIGATION OF THE USE OF HIGH PURITY OXYGEN AERATION IN THE CONVENTIONAL ACTIVATED SLUDGE PROCESS,
J. G. Albertsson, J. R. McWhirter, E. K. Robinson, and N. P. Vahldieck. May 70, 198p*
W70-09833, FWQA-17050-DNW-5/70

Descriptors: (*Activated sludge process, *Aeration), (*Sewage treatment, Activated sludge process), Oxygen, Biochemical oxygen demand, Oxygenation, Cost estimates, Plant layout, Air, Biomass, Maintenance, Sludge disposal, Aerators.
Identifiers: *Waste water treatment.

A full scale system designed to demonstrate the practical and economical use of high purity oxygen gas in aeration of the conventional activated sludge waste treatment process was tested under a variety of operating conditions in a direct performance comparison with a parallel air aerated system. A sparged-turbine, gas-liquid contacting unit was employed in covered tanks of conventional design with liquid and gas staging for cocurrent flow of each phase. This oxygenation system required very low power input for oxygen transfer and liquid mixing. The oxygenation system could operate with MLVSS concentrations of as high as 4500 mg/liter achieving about 90% BOD removals at aeration detention times as low as 1.2 hours (raw flow + recycle flow) treating domestic waste of 220 mg/liter BOD. Biomass from the oxygenation system is highly flocculent and readily settleable with desirable handling characteristics. Recycle and waste activated sludge suspended solids concentrations of about 3% were achieved. Process advantages recognized with the oxygenation system indicate significant reductions in secondary waste treatment costs in comparison to conventional diffused air aerated systems. (WRSIC abstract)

PB-194 316
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
IN-PLANT SURVEY OF TELEVISION RECEIVERS FOR X-RADIATION EMISSION CAPABILITY.
Rept. for Jun-Sep 69,
D. R. Smith, S. E. Reiter, and T. M. Smith. Sep 70, 76p* BRH/DEP-70-24

Descriptors: (*Television receivers, *Radiation hazards), X rays, Radiation measuring instruments, Permissible dosage, Safety engineering, Color television.
Identifiers: In plant surveys.

Visits were made to the facilities of 21 domestic television manufacturers and one retailer of foreign receivers to measure x-radiation emissions from television receivers considered typical of those being marketed since the effective date of the Radiation Control for Health and Safety Act of 1968. The test data obtained during these visits provided basic information on the capability of the receivers to emit x-radiation under certain operating conditions, including various adjustments to the receivers that could result in x-radiation emission under conditions expected to be found during home use. The information was used in the development of the performance standard for television receivers and also in the development of recommendations for future programs of compliance testing under the performance standard. (Author)

PB-194 376
Copley International Corp., New York.
NATIONAL SURVEY OF THE ODOR PROBLEM. PHASE I OF A STUDY OF THE SOCIAL AND ECONOMIC IMPACT OF ODORS.
Jan 70, 258p* APTD-0580-1
Contract PHS-CPA-22-69-50
See also Appendix, PB-194 377.

Descriptors: (*Odors, *Public opinion), (*Air pollution, Odors), Surveys, Industrial wastes, Urban areas, Government policies, Atmospheric motion, Wind (Meteorology), Tanning materials, Refineries, Exhaust gases, Chemical industry, Sewage treatment, Tall oil, Public health, Petroleum industry.

The intent was the generation of information relative to the basic definition, identification, and assessment of the national odor problem. Three factors - odor producing potential of industrial odorant sources, atmospheric vulnerability, and size of population - were developed separately and then combined for an indication of the odor problem potential of each three digit postal zip code area in the nation. Local air pollution control agencies were surveyed to identify areas where they believe that significant odor problems exist. Within the principal cities of each of seven representative metropolitan areas, two-day technical field investigations and public opinion surveys were conducted. Sensory evaluations of odor were also performed in Philadelphia, Pennsylvania. Odor problem potential exists in most metropolitan areas in the United States. But,

primarily because of meteorological factors, the probability of encountering odor problems is greatest in the Appalachian and California Coastal metropolitan areas. A large number of residents - perhaps as many as 25 million - perceive odors as problems and desire some form of abatement. The results of the mail survey and personal interviews of local air pollution control agencies indicated that when concentrations of air pollutants can be related to amounts of property damage and/or ill health, abatement criteria (e.g., minimum levels of emissions) can be established and enforced. However, in cases of air pollutants causing only odors, such relationships are generally non-existent. Consequently, odor abatement criteria, if any, are typically based on number of complaints and inadequately backed by nuisance laws. (Author)

PB-194 377
Copley International Corp., New York.
NATIONAL SURVEY OF THE ODOR PROBLEM. PHASE I OF A STUDY OF THE SOCIAL AND ECONOMIC IMPACT OF ODORS. APPENDIX.
Jan 70, 360p* APTD-0580-2
Contract PHS-CPA-22-69-50
See also PB-194 376.

Descriptors: (*Odors, *Public opinion), (*Air pollution, Odors), Surveys, Urban areas, Questionnaires, Industrial wastes, Sewage treatment, Exhaust gases, Food industry, Chemical industry, Petroleum industry, Metal industry, Paper industry, Combustion products.

The report is an appendix to PB-194 376 and contains the following topics: Identification of odor producing air pollutants; Three-digit zip code areas of the United States; Summary of survey results from questionnaires received from 100 local air pollution control agencies; Location of field investigation sites and public opinion survey areas; Sensory evaluation of odors data; Findings of public opinion survey of residents - summary of test and control groups for all cities combined; Findings of public opinion survey of residents - summary, by income, by occupation, by education, and by age; Findings of public opinion survey of businessmen - summary of test and control groups for all cities combined and individual cities; Public opinion survey questionnaires and instructions to interviewers.

PB-194 410
Environmental Health Service, Rockville, Md.
TECHNICAL, INTELLIGENCE, AND PROJECT INFORMATION SYSTEM FOR THE ENVIRONMENTAL HEALTH SERVICE. VOLUME I. MANAGEMENT ASSISTANCE AND PLANNING.
Final rept.,
D. L. Morrison, D. B. Menzel, K. L. Nielsen, A. A. Levin, and C. W. Hamilton. 29 Jun 70, 104p*
CPS-69-005-1
Contract PHS-CPS-69-005
See also Volume 2, PB-194 411.

Descriptors: (*Research management, Public health), (*Project planning, Public health), (*Public health, *Environments), Management, Management analysis, Management methods, Management planning, Pollution, Mathematical models, Forecasting, Information systems, Hazards, Hazardous materials, Monitoring.
Identifiers: *Environmental health.

The concepts embodied in the development and implementation of a comprehensive R and D and program planning capability for EHS were examined. Environmental stressors were selected as the basis for planning rather than categorical approaches. For the mix of complex problems encountered by EHS, a system to establish priorities is required. The integrated planning system which was recommended utilizes mathematical models to assess the impacts of technology upon man and his environment and the assignment of priorities based upon quality of life indices. Specific elements of the management-assistance system which was defined include an overview environmental health planning function to provide coordinated and comprehensive planning in the man-centered ecosystem context; an impact assessment capability based upon a hierarchy of mathematical models; a threat identification function to identify and evaluate potential threats to man and the environment through intensification or extension of current use patterns of products and services or through introduction of new stressors; and an environmental health information network to provide a well-organized information base. A hierarchical approach to the development of mathematical models for prediction of the impacts of stressors upon man and the environment was described and specific examples are presented for lead in the environment. (Author)

PB-194 411
Environmental Health Service, Rockville, Md.
TECHNICAL, INTELLIGENCE, AND PROJECT INFORMATION SYSTEM FOR THE ENVIRONMENTAL HEALTH SERVICE. VOLUME II. EHS INFORMATION NETWORK ANALYSIS.
Final rept.,
Ralph L. Darby, Robert S. Kohn, Thomas E. Carroll, W. David Penniman, and David L. Morrison. 29 Jun 70, 147p* CPS-69-005-2
Contract PHS-CPS-69-005
See also PB-194 412, Volume 3.

Descriptors: (*Information systems, *Environmental surveys), (*Research management, Public health), (*Project planning, Public health), (*Public health, *Environments), Environmental engineering, Information retrieval, Surveillance, Monitors, Libraries, Resources, Thesauri, Data storage, Documentation, Computer programs.
Identifiers: *Environmental health.

The study for the Environmental Health Service is an investigation of the problems being faced in protecting man's environment from threats created by man. This study included the following major efforts: (1) research and development planning in the perspective of man in his total environment, (2) information network analysis, and (3) model case studies. This volume of the report concerns itself with Information Network Analysis. An investigation was made of the existing EHS information resources including the monitoring and surveillance activities. A survey was conducted of the documentation systems and libraries in order to determine their operational characteristics as related to an information network. (Author)

PB-194 412
Environmental Health Service, Rockville, Md.
TECHNICAL, INTELLIGENCE, AND PROJECT INFORMATION SYSTEM FOR THE ENVIRONMENTAL HEALTH SERVICE. VOLUME III. LEAD MODEL CASE STUDY.
Final rept.,
Garson A. Lutz, Arthur A. Levin, Sanford G. Bloom, Kaj L. Nielsen, and Jack L. Cross. 29 Jun 70, 142p* CPS-69-005-3
Contract PHS-CPS-69-005
See also Volume 4, PB-194 413.

Descriptors: (*Air pollution, Lead (Metal)), (*Lead (Metal), *Pollution), (*Public health, Lead (Metal)), (*Project planning, Public health), Toxicity, Ecology, Mathematical models, Hazards, Diseases, Economic analysis, Fuels, Sources, Air pollution, Environments, Research management, Children, Hazardous materials.
Identifiers: *Environmental health.

The lead model case study was undertaken to serve as a working example and to evaluate the technical, intelligence, and project information system under consideration for EHS. Occurrence and use patterns for lead within the U.S. were examined. The major categories of uses in decreasing order were production of storage batteries and accessories, gasoline antiknock additives, pigments, ammunition, solder, cable covering, and caulking lead. Leaded fuels are the major source of environmental lead. Pediatric plumbism, the most significant acute health problem, arises from lead used as a pigment. The economic aspects of this problem area were investigated. While lead is very slowly absorbed from environmental sources, its gradual accumulation in the body is the basis for progressive toxicity. Additional research is required to determine the chronic effects of lead in the environment on health, and better diagnostic and therapeutic techniques are needed in support of this research. A mathematical model was developed to represent the environmental transport of the stressor lead from several sources with the subsequent intake of lead by man. This model can be used to assess the impact of contemplated actions on lead body burdens, to define R and D requirements, and to identify the needs and locations for monitoring and surveillance. A categorized bibliography for lead is included. (Author)

PB-194 413
Environmental Health Service, Rockville, Md.
TECHNICAL, INTELLIGENCE, AND PROJECT INFORMATION SYSTEM FOR THE ENVIRONMENTAL HEALTH SERVICE. VOLUME IV. PESTICIDES MODEL CASE STUDY.
Final rept.,
J. K. Voss, J. W. Blaylock, M. J. Schneider, L. C. Schwendiman, and C. J. Touhill, Jr. 29 Jun 70, 63p* CPS-69-005-4
Contract PHS-CPS-69-005
See also Volume 5, PB-194 414.

Descriptors: (*Air pollution, DDT), (*Water pollution, DDT), (*Pesticides, *Pollution), (*Public health, *DDT), (*Project planning, Public health), Ecology, Hazards, Hazardous materials, Models, Chlorohydrocarbons, Sources, Air pollution, Water pollution, Environments, Toxicity.
Identifiers: *Environmental health.

DDT was selected as the compound for this study due to paucity of data regarding environmental effects of other classes of pesticides. Human exposure to pesticides was examined from two major pathways; the direct pathway which deals with direct uptake from primary sources of pesticide release, and the indirect pathway which involves human exposure by translocation through air, water, or food. Reductions in accidential poisonings could be made by limiting the total toxicant contents of home packages of pesticides, and means to reduce deaths from aerial applications warrant further study of this method of application. The control of human burden of pesticides by control of food residues is only partially effective since evidence on pesticide distribution in the environment suggests that about half of the intake is from inhalation of insecticide aerosols or dust laden with insecticides. There is presently no evidence that pesticide exposure directly shortens human life. Fish and birds are more sensitive to pesticides in the environment. Fish lack the basic microsomal oxidase enzyme systems which detoxify pesticides and birds appear to be very sensitive to the sterodal hormone mimicking effects of the chlorinated hydrocarbons. (Author)

PB-194 414
Environmental Health Service, Rockville, Md.
TECHNICAL, INTELLIGENCE, AND PROJECT INFORMATION SYSTEM FOR THE ENVIRONMENTAL HEALTH SERVICE. VOLUME V. DIRECTORY OF EHS INFORMATION FACILITIES WITH SELECTED SUPPLEMENTARY RESOURCES.
Final rept.,
Ralph L. Darby, Robert S. Kohn, Thomas E. Carroll, W. David Penniman, and David L. Morrison. 29 Jun 70, 70p* CPS-69-005-5
Contract PHS-CPS-69-005
See also Volume 1, PB-194 410.

Descriptors: (*Research management, Public health), (*Project planning, Public health), (*Public health, *Environments), (*Information systems, Environmental surveys), Management methods, Management planning, Management, Environmental engineering, Information retrieval, Libraries, Resources, Surveillance, Monitors.
Identifiers: *Environmental health.

This study is a multifaceted and intensive investigation of the problems facing the EHS in protecting man's environment from threats created by man. This study included the following major efforts: (1) research and development planning in the perspective of man in his total environment, (2) information network analysis, and (3) model case studies. This directory represents an inventory of information and data resources useful to the personnel of the Environmental Health Service. It is divided into three principal categories: (1) EHS-sponsored resources, (2) non-EHS resources, and (3) monitoring and surveillance activities of both the National Air Pollution Control Administration and the Environmental Control Administration. A subject-index, an index of information facilities, and an index of the parent or sponsoring organization are provided. (Author)

PB-194 429
National Air Pollution Control Administration, Raleigh, N.C.
NITROGEN OXIDES: AN ANNOTATED BIBLIOGRAPHY.

Aug 70, 636p* NAPCA-Pub-AP-72
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.75 as HE20.1309:AP-72.

Descriptors: (*Nitrogen oxides, *Bibliographies), (*Air pollution, Nitrogen oxides), (*Public health, Nitrogen oxides), Nitrogen oxide (N20), Nitrogen dioxide, Nitrogen oxide (NO), Exhaust gases, Combustion products, Chemical analysis, Microorganisms, Toxicity, Catalysis, gas chromatography, Monitors, Absorption spectra, Industrial wastes, Government policies, Photochemical reactions, Electric power plants, Reaction kinetics, Respiratory diseases, Smog.
Identifiers: Plant damage, *Air pollution control, *Air pollution detection.

Approximately 1500 abstracts of technical literature related to nitrogen oxides and air pollution are presented. The abstracted literature was collected from many sources; all are now included in the information retrieval system of the Air Pollution Technical Information Center (APTIC). Most of the literature is recent (1959-1970). The abstracts are arranged in thirteen broad subject categories. Subject, author, and geographic location indexes are included. the author index lists first and second (if any) authors individually. The geographical location index includes two sections; United States (states/cities); and Foreign (countries/cities). (Author

PB-194 484
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
LABORATORY TESTING AND EVALUATION OF MICROWAVE OVENS,
Stephen W. Smith, James W. Nicolls, Robert L. Moore, and Walter E. Gundaker. Oct 70, 140p*
BRH/DEP-70-25

Descriptors: (*Cooking devices, Microwaves), (*Safety engineering, Cooking devices), (*Radiation hazards, Cooking devices), Safety devices, Leakage, Doors.
Identifiers: *Microwave ovens, Microwave leakage.

An examination was made of 14 microwave ovens from nine domestic and two foreign manufacturers. Twelve of the ovens are (or have been) available on the U.S. market, and two are prototypes not presently available. The report presents details of physical and electronic construction, technical specifications, and the microwave leakage levels determined for each oven. (Author)

PB-194 611
Bureau of Radiological Health, Rockville, Md. Div. of Biological Effects.
BIOLOGICAL ASPECTS OF ULTRAVIOLET RADIATION. A REVIEW OF HAZARDS.
Technical rept.,
William M. Leach. Sep 70, 38p* DBE-70-3

Descriptors: (*Radiation hazards, *Ultraviolet radiation), Tissues (Biology), Radiation effects, Damage, Whole body irradiation, Standards, Radiation dosage, Public health, Radiation tolerance, Cells (Biology), Malignant neoplasms.

Ultraviolet radiation is produced by arcs and incandescent sources operating at high temperatures. The envelope of closed sources may filter out most of the ultraviolet radiation produced. Of the transmitted ultraviolet, two portions of the spectrum are of public health interest. Wavelengths between 1900 and 3000 angstroms (far ultraviolet) are mutagenic, and may be lethal to cells. Wavelengths above about 3000 angstroms (near ultraviolet) appear not to be mutagenic, and are lethal at doses which are very high in comparison with lethal doses in the 1900-3000 angstroms range. However, skin cancer may result from repeated near ultraviolet exposure. Penetration of ultraviolet beyond the skin of mammals is negligible. Wavelengths below about 1900 angstroms (vacuum ultraviolet) are absorbed by air and water, so exposure of biological tissue must be performed in vacuo. (Author)

PB-194 688
Consolidated Engineering Technology Corp., Mountain View, Calif.
INVESTIGATION OF A SUBSTITUTE FUEL TO CONTROL AUTOMOTIVE AIR POLLUTION.
Final rept.,
R. E. Fitch, and J. D. Kilgore. Feb 70, 77p*
CETEC-FR-01800
Contract PHS-CPA-22-69-70

Descriptors: (*Air pollution, *Exhaust gases), (*Spark ignition engines, Air pollution), (*Automotive fuels, *Methyl alcohol), Aldehydes, Nitrogen oxides, Hydrocarbons, Internal combustion engines, Carburetors, Combustion, Compression ratio.
Identifiers: *Automobile exhausts, *Air pollution control.

A study was conducted to investigate the feasibility of using methanol as a substitute fuel for gasoline to reduce exhaust pollutants emitted from automotive engines. Work was performed in two phases encompassing both automotive and single cylinder laboratory engine tests. It was concluded that methanol displays significant potential as a pollution control substitute fuel for gasoline. In the automotive tests conducted with a slightly modified, non-optimized engine system, methanol was shown to be a satisfactory fuel from the standpoint of engine operation and to produce methanol emissions as low as 1900 PPM (317 PPM-hexane equivalent). Vehicle mileage was low (7 to 9 mpg) as expected. Suspected high aldehyde emissions were confirmed. It is believed that optimization of the fuel-air ratio, the mixture distribution to the cylinders, and heating of the fuel or fuel-air mixture, will result in improved performance and substantially reduced emissions of all pollutants, except NOx. Laboratory engine operation with blends of reform gases (CO + 2H2) and methanol was shown to be successful in improving engine performance (subject to engine knock limitations) and providing major reductions in methanol and formaldehyde emissions. If the reforming technique can be economically implemented in an automotive system, it is highly probable that emission levels can be achieved which are well below those possible with gasoline. (Author)

PB-194 760
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1968 DATA TABULATIONS AND SUMMARIES, DENVER.

Dec 69, 104p APTD-69-17

Descriptors: (*Air pollution, *Urban areas), Colorado, Monitors, Continuous sampling, Diurnal variations, Carbon dioxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols.
Identifiers: *Air pollution detection, *Denver (Colorado), Continuous air monitoring projects, Soiling index.

Hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants), and 2-hour measurements of soiling index levels are tabulated. A brief summary of monthly means and maximums' and graphs of seasonal diurnal patterns of gaseous pollutants are included. Annual frequency distributions of the data pertaining to gases and soiling index are tabulated for Denver. (Author)

PB-194 761
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1968 DATA TABULATIONS AND SUMMARIES, PHILADELPHIA.

Dec 69, 104p APTD-69-18

Descriptors: (*Air pollution, *Urban areas), Pennsylvania, Monitors, Continuous sampling, Diurnal variations, Carbon dioxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols, Tables (Data).
Identifiers: *Air pollution detection, *Philadelphia (Pennsylvania), Continuous air monitoring projects, Soiling index.

Hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants), and 2-hour measurements of soiling index level are tabulated. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are included. Annual frequency distributions of the data pertaining to gases and soiling index are tabulated for Philadelphia. (Author)

PB-194 762
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1968 DATA TABULATIONS AND SU. IMARIES, ST. LOUIS.

Dec 69, 107p APTD-69-19

Descriptors: (*Air pollution, *Urban areas), Missouri, Monitors, Continuous sampling, Diurnal sampling, Carbon dioxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols, Tables (Data).
Identifiers: *Air pollution detection, *Saint Louis (Missouri), Continuous air monitoring projects, Soiling index.

Hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants), and 2-hour measurements of soiling index levels are tabulated. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are included. Annual frequency distributions of the

data pertaining to gases and soiling index are tabulated for St. Louis. (Author)

PB-194 763
National Air Pollution Control Administration, Raleigh, N.C. Div of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1968 DATA TABULATIONS AND SUMMARIES, WASHINGTON, D. C.

Dec 69, 104p APTD-69-20

Descriptors: (*Air pollution, *Urban areas), (*District of Columbia, Air pollution), Monitors, Continuous sampling, Diurnal variations, Carbon dioxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols, Tables (Data).
Identifiers: *Air pollution detection, Continuous air monitoring projects, Soiling index.

Hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants), and 2-hour measurements of soiling index levels are tabulated. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are included. Annual frequency distributions of the data pertaining to gases and soiling index are tabulated for Washington, D. C. (Author)

PB-194 764
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1962-1967. SUMMARY OF MONTHLY MEANS AND MAXIMUMS.

Apr 69, 131p APTD-69-1

Descriptors: (*Air pollution, *Urban areas), (*District of Columbia, Air pollution), Continuous sampling, Monitors, Concentration (Composition), Carbon monoxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Hydrocarbons, Arithmetic mean, Oxidizers, Tables (Data), Illinois, Ohio, Louisiana, Colorado, Pennsylvania, California, Missouri.
Identifiers: *Air pollution detection, Continuous air monitoring projects, *Chicago (Illinois), *Cincinnati (Ohio), *Denver (Colorado), *New Orleans (Louisiana), *Philadelphia (Pennsylvania), *Saint Louis (Missouri), *San Francisco (California).

For each of the Continuous air monitoring projects (CAMP) cities, summarized concentrations of the air pollutants carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, hydrocarbons, and total oxidants are tabulated. The data had been collected in: Chicago, 1962-1967; Cincinnati, 1962-1967; Denver, 1965-1967; New Orleans, 1962-1963; Philadelphia, 1962-1967; St. Louis, 1964-1967; San Francisco, 1962-1964; and Washington, D.C., 1962-1967. (Author)

PB-194 766
National Air Pollution Control Administration, Durham, N.C.
NEW CUMBERLAND, WEST VIRGINIA - KNOX TOWNSHIP, OHIO. AIR POLLUTION ABATEMENT ACTIVITIES.
Technical rept.

Jun 69, 79p APTD-69-13
Report on Pre-Conference Investigations.

Descriptors: (*Air pollution, *Urban areas), (*Electric power plants, Air pollution), (*Combustion products, Air pollution), Particles, Sulfur dioxide, Climatology, Demography, Ohio, West Virginia, Attitude surveys, Public opinion, Plants (Botany), Plant pathology, Temperature inversions
Identifiers: *Air pollution control, *New Cumberland (West Virginia), *Plant damage, *Knox Township (Ohio).

The aim was to assist the governmental agencies at an abatement conference concerned with interstate air pollution in their consideration of: (1) the occurrence of air pollution subject to abatement; (2) the adequacy of measures taken toward abatement of air pollution; (3) the nature of the delay, if any, in abating air pollution; and (4) the necessary remedial action, if any. These subjects are covered: history of the problem; history of abatement activity; demography of the area; climatology of the area; description of the Toronto power plant facility, its operation, and emissions; assessment of the air quality data and effects of pollution; calculated impact of Toronto plant on New Cumberland; and control technology for the Toronto plant. (Author)

PB-194 767
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1968 DATA TABULATIONS AND SUMMARIES, CHICAGO.

Dec 69, 104p APTD-69-15

Descriptors: (*Air pollution, *Urban areas), Illinois, Monitors, Continuous sampling, Diurnal variations, Carbon dioxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols, Tables (Data).
Identifiers: *Air pollution detection, *Chicago (Illinois), Continous air monitoring projects, Soiling index.

Hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants), and 2-hour measurements of soiling index levels are tabulated. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are included. Annual frequency distributions of the data pertaining to gases and soiling index are tabulated for Chicago. (Author)

PB-194 768
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1968 DATA TABULATIONS AND SUMMARIES, CINCINNATI.

Dec 69, 104p APTD-69-16

Descriptors: (*Air pollution, *Urban areas), Ohio, Monitors, Continuous sampling, Diurnal variations, Carbon dioxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols, Tables (Data).
Identifiers: *Air pollution detection, Cincinnati (OHIO), Continuous air monitoring projects, Soiling index.

Hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants), and 2-hour measurements of soiling index levels are tabulated. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are included. Annual frequency distributions of the data pertaining to gases and soiling index are tabulated for Cincinnati. (Author)

PB-194 784
Federal Water Pollution Control Administration, Washington, D.C.
FEASIBILITY OF HYDROLYSIS OF SLUDGE USING LOW PRESSURE STEAM WITH SO2 AS A HYDROLYTIC ADJUNCT AND UTILIZATION OF THE RESULTING HYDROLYSATE.
Water pollusion control research series.

Dec 69, 38p* FWPCA-17070-EKN-12/69 W71-00164
Prepared in cooperation with Snell (Foster D.), Inc., Florham Park, N.J., Contract DI-14-12-188.

Descriptors: (*Sewage treatment, Sludge disposal), (*Activated sludge process, Hydrolysis), (*Sludge disposal, *Hydrolysis), (*Feeding stuffs, Sludge), Sulfurous acid, Proteins, Filtration, Waste disposal, Reduction (Chemistry), Sulfur dioxide, Concentrating, Molasses, Cost estimates.

Sulfurous acid, when used with hydrolysis in the treatment of activated sludge, will increase soluble solids, improve filtration efficiencies and reduce moisture content of the resultant filter cake. Use of a 0.5% sulfurous acid and hydrolytic treatment of sludge at 140 degrees C for one hour increased the soluble solids content of the activated sludge by 20%. Concentration of the solubilized extract produced a syrup; 85% of the solids content of the syrup was organic. By TKN estimates, over 20% of these solids were proteinaceous. An amino acid analysis indicated it could be of value as an animal feed, and this was confirmed in rat feeding studies (at a 10% level in the diets) showing an efficiency of food utilization of 42 for the organic molasses as compared to 39 for cane molasses. (WRSIC abstract)

PB-194 802
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1967 DATA TABULATIONS AND SUMMARIES, DENVER.
Apr 69, 110p APTD-69-8

Descriptors: (*Air pollution, *Urban areas), Colorado, Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Carbon monoxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Oxidizers, Aerosols, Arithmetic means, Tables (Data).
Identifiers: *Air pollution detection, *Denver (Colorado), Continuous air monitoring projects, Soiling index.

Hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants), and 2-hour measurements of soiling index levels are tabulated for Denver. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are included. Annual frequency distributions of the data pertaining to gases and soiling index are presented for Denver, and for Chicago, Cincinnati, Philadelphia, St. Louis, and Washington, D. C. (Author)

PB-194 803
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1967 DATA TABULATIONS AND SUMMARIES, PHILADELPHIA.

Apr 69, 129p APTD-69-9

Descriptors: (*Air pollution, *Urban areas), Pennsylvania, Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Carbon monoxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Oxidizers, Aerosols, Arithmetic means, Tables (Data).
Identifiers: *Air pollution detection, *Philadelphia (Pennsylvania), Continuous air monitoring projects, Soiling index.

Hourly average concentrations of eight gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, total oxidants, methane hydrocarbon, and non-methane hydrocarbons), and 2-hour measurements of soiling index are tabulated for Philadelphia. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are also included. Annual frequency distributions of the data pertaining to gases and soiling index for Philadephia, and also for Chicago, Cincinnati, Denver, St. Louis, and Washington, D. C. are tabulated. (Author)

PB-194 804
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1967 DATA TABULATIONS AND SUMMARIES, ST. LOUIS.

Apr 69, 103p APTD-69-10

Descriptors: (*Air pollution, *Urban areas), Missouri, Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Carbon monoxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Oxidizers, Aerosols, Arithmetic means, Tables (Data).
Identifiers: *Air pollution detection, *Saint Louis (Missouri), Soiling index, Continuous air monitoring projects.

Hourly average concentrations of five gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, and total oxidants), and 2-hour measurements of soiling index are tabulated for Saint Louis. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are also included. Annual frequency distributions of the data pertaining to gases and soiling index for St. Louis, and also for Chicago, Cincinnati, Denver, Philadelphia, and Washington, D. C. are tabulated. (Author)

PB-194 805
National Air Pollution Control Administration, Arlington, Va.
TALL STACKS, VARIOUS ATMOSPHERIC PHENOMENA, AND RELATED ASPECTS.

May 69, 100p APTD-69-12
Revision of report dated 1 Aug 68.

Descriptors: (*Air pollution, *Atmospheric motion), (*Sulfur dioxide, Air pollution), (*Bibliographies, Air pollution), (*Flue gases, Atmospheric motion), Combustion products, Atmospheric diffusion, Industrial wastes, Plumes, Chimneys, Incinerators, Electric power plants, Smoke, Topography, Meteorological data, Dispersions.

Dispersion from tall stacks is discussed. Then a bibliography of 214 abstracts of documents currently in the information retrieval system of the Air Pollution Technical Information Center is presented. The abstracts are arranged in three major sections: Tall Stacks; Atmospheric Phenomena; and Miscellaneous. Within each section, they are alphabetized by author. Most date from the late'60's, however the earliest is dated 1949. (Author)

PB-194 806
National Air Pollution Control Administration, Raleigh, N.C.
AIR POLLUTION CONTROL ACTIVE RESEARCH GRANTS FOR FISCAL YEAR 1969.
Oct 69, 43p APTD-69-21

Descriptors: (*Air pollution, *Research projects), Grants, Expenses, Public health, Respiratory diseases, Atmospheric corrosion, Chemical analysis, Exhaust gases, Paper industry.
Identifiers: *Air pollution control, Plant damage.

Research grants were awarded in eight major areas: human health effects, agricultural effects, socio-economic and political studies, analyses and physico-chemical investigations, development of analytic methods and equipment, meteorology, air pollution source control, and communications. A table summarizes the quantity and amount of the grants in each categorical area. A second table shows the distribution of the quantity, amount, and percent of total funds by subject area within each category. In the main listing, for each subject area within each category, the following are listed: each grant number; the grantee's name, institution, and project title; project period; and monetary support. A numerical index of grant numbers refers the reader to the category where they are listed. (Author)

PB-194 813
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1962-1963 DATA TABULATIONS AND SUMMARIES, CHICAGO.

May 69, 173p APTD-69-4

Descriptors: (*Air pollution, *Urban areas), Illinois, Monitors, Continuous sampling, Diurnal variations, Carbon monoxide, Nitrogen oxide (NO), Nitrogen dioxide, Hydrocarbons, Oxidizers, Sulfur dioxide, Aerosols, Arithmetic means, Tables (Data), Seasonal variations.
Identifiers: *Air pollution detection, *Chicago (Illinois), Continuous air monitoring projects, Soiling index.

Summaries of hourly average concentrations of carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbon, and total oxidant are tabulated for Chicago. The soiling index for 1963 is also tabulated as are brief summaries of monthly means and maximums, and annual frequency distributions of data. (Author)

PB-194 814
Little (Arthur D.), Inc., Cambridge, Mass.
PROSPECTS FOR ELECTRIC VEHICLES. A STUDY OF LOW-POLLUTION-POTENTIAL VEHICLES - ELECTRIC.

Oct 69, 105p APTD-69-52
Contract PH-86-67-108

Descriptors: (*Electric vehicles, Forecasting), (*Air pollution, *Transportation), (*Electric automobiles, Forecasting), (*Electric batteries, Electric vehicles), (*Highway transportation, Electric vehicles), Electric trucks, Buses (Vehicles), Alkali metals, Storage batteries, Electric controllers, Molten salt electrolytes, Thermal insulation, Electric motors, Fuel cells, Cost estimates, Refueling, Hybrid propulsion, Weight (Mass), Metal air batteries, Lead acid batteries, Battery chargers, Research projects, Automobile bodies, Aerodynamic drag.
Identifiers: *Air pollution control.

The major purpose of the research described was to assess the state of the art in the technologies on which the future development of electric highway vehicles depends. The assessment is made on the basis that there will be no major change in the patterns of urban transportation and focuses upon the technical requirements of the vehicle. As a framework for the study, technical and, to a lesser extent, cost criteria were established for six classes of electric vehicles, most of which correspond closely in performance to existing conventionally powered types. On the basis of these criteria the prospects for vehicle application of various electric motor and control systems and a wide range of electrical power sources including batteries, fuel cells, and engine-generator-battery hybrids are compared. The most promising systems for further development are identified and the magnitude of the shortfall in their present characteristics is estimated. Recommendations are made for the expansion of future effort in these areas, taking into account the expected contributions from existing programs in the public and private sectors of the economy. The technology of electric vehicles appears to be attainable, quite possibly at an acceptable cost. A very substantial technical effort is called for if the required technologies are to be brought to maturity. The technical risks of this endeavor are too great for the investment to be borne by private capital alone, particularly since the major objective is a technology desirable for its social good rather than for its profit potential. (Author)

PB-194 824
National Air Pollution Control Administration, Durham, N.C.
AIR POLLUTANT EMISSIONS RELATED TO LAND AREA - A BASIS FOR A PREVENTIVE AIR POLLUTION CONTROL PROGRAM,
J. D. Williams, J. R. Farmer, R. B. Stephenson, G. G. Evans, and R. B. Dalton. Jul 68, 19p APTD-68-11

Descriptors: (*Air pollution, *Urban areas), (*Land use zoning, Air pollution), Regional planning, Atmospheric motion, Sulfur dioxide, Combustion products, Industrial wastes, Standards, Exhaust gases, Atmospheric diffusion, Electric power plants.
Identifiers: *Air pollution control.

Advances in technology have made it possible to establish zoning performance standards, which will prevent air-use - land-use conflicts. In the past, such standards were based on source capability and were uniformly inadequate. Now, because of the ability to predict air pollution levels, standards that accomplish both preventive and control aims can be applied. Land area, as used for urban planning purposes, reflects the diffusion capability and greater knowledge concerning the diffusion of pollutants in the air, prediction systems are within practical application range. An example of the output information from such a diffusion model is discussed. (Author)

PB-194 859
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1964 DATA TABULATIONS AND SUMMARIES. NATIONAL AIR SURVEILLANCE NETWORKS: CHICAGO, CINCINNATI, PHILADELPHIA, ST. LOUIS, WASHINGTON, D.C.

May 69, 455p APTD-69-3

Descriptors: (*Air pollution, *Urban areas), (*District of Columbia, Air pollution), Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Arithmetic mean, Concentration (Composition), Carbon monoxide, Hydrocarbons, Nitrogen dioxide, Nitrogen oxide (NO), Oxidizers, Sulfur dioxide, Aerosols, Tables (Data), Pennsylvania, Ohio, Missouri, Illinois.
Identifiers: Continuous air monitoring projects, Air pollution detection, Soiling index, *Chicago (Illinois), *Cincinnati (Ohio), *Philadelphia (Pennsylvania), *Saint Louis (Missouri).

For each of five major cities, summaries of hourly average concentrations of carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, total oxidants, and 2-hour measurements of soiling index are tabulated. The cities are: Chicago, Cincinnati, Philadelphia, St. Louis, and Washington, D.C. Brief summaries of monthly means and maximums, and annual frequency distributions of data from these cities are also tabulated. (Author)

PB-194 860
National Air Pollution Control Administration, Arlington, Va.

1965 DATA TABULATIONS AND SUMMARIES, CONTINUOUS AIR MONITORING PROJECTS, NATIONAL AIR SURVEILLANCE NETWORKS.

May 69, 523p APTD-69-5

Descriptors: (*Air pollution, *Urban areas), (*District of Columbia, Air pollution), Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Carbon monoxide, Nitrogen dioxide, Nitrogen oxide (NO), Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols, Arithmetic mean, Illinois, Ohio, Colorado, Pennsylvania, Missouri, Tables (Data).
Identifiers: *Chicago (Illinois), *Cincinnati (Ohio), *Denver (Colorado), *Philadelphia (Pennsylvania), *Saint Louis (Missouri), Air pollution detection, Continuous air monitoring projects, Soiling index.

For each of six major cities, summaries of hourly average concentrations of carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbon, and total oxidant are tabulated. The cities are Chicago, Cincinnati, Denver, Philadelphia, St. Louis, and Washington, D. C. Summaries of 2-hour measurements of soiling index are also tabulated for each city except Denver. Brief summaries of monthly means and maximums, and annual frequency distributions of data are also tabulated. (Author)

PB-194 861
National Air Pollution Control Administration, Arlington, Va.
1967 DATA TABULATIONS AND SUMMARIES, CONTINUOUS AIR MONITORING PROJECTS, NATIONAL AIR SURVEILLANCE NETWORKS, CINCINNATI.

Apr 69, 102p APTD-69-7

Descriptors: (*Air pollution, *Urban areas), Ohio, Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Carbon monoxide, Nitrogen dioxide, Nitrogen oxide (NO), Sulfur dioxide, Hydrocarbons, Oxidizers, Aerosols, Arithmetic mean, Tables (Data).
Identifiers: *Cincinnati (Ohio), Air pollution detection, Continuous air monitoring projects, Soiling index.

Hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants), and 2-hour measurements of soiling index are tabulated for Cincinnati, Ohio. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants are also included. Annual frequency distributions of the data pertaining to gases and soiling index for Cincinnati and also for Chicago, Denver, Philadelphia, St. Louis, and Washington, D. C. are tabulated. (Author)

PB-194 862
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: 1967 DATA TABULATIONS AND SUMMARIES, WASHINGTON, D. C.

Apr 69, 103p APTD-69-11

Descriptors: (*Air pollution, *Urban areas), (*District of Columbia, Air pollution), Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Arithmetic mean, Concentration (Composition), Carbon monoxide, Hydrocarbons, Nitrogen dioxide, Nitrogen oxide (NO), Oxidizers, Sulfur dioxide, Aerosols, Tables (Data).
Identifiers: Continuous air monitoring projects, Air pollution detection, Soiling index.

Hourly average concentrations of five gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, and total oxidants) and 2-hour measurements of soiling index levels for Washington, D. C. are included. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants is also included. Annual frequency distributions of the data pertaining to gases and soiling index for Washington, D.C. and for Chicago, Cincinnati, Denver, Philadelphia, and St. Louis are tabulated. (Author)

PB-194 863
National Air Pollution Control Administration, Cincinnati, Ohio. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS IN PHILADELPHIA 1962 - 1965.

Aug 69, 356p APTD-69-14

Descriptors: (*Air pollution, *Urban areas), Pennsylvania, Monitors, Continuous sampling, Diurnal variations, Seasonal variations, Arithmetic mean, Concentration (Composition), Carbon monoxide, Hydrocarbons, Nitrogen dioxide, Nitrogen oxide (NO), Oxidizers, Sulfur dioxide, Aerosols, Tables (Data), Particles.
Identifiers: Continuous air monitoring projects, *Philadelphia (Pennsylvania), Air pollution detection, Soiling index.

Data on the atmospheric levels of carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, and total oxidants and on soiling index are analyzed and discussed for Philadelphia, Pennsylvania. To facilitate the use of the volume as a reference, the data are tabulated as hourly, daily, and monthly mean concentrations. Background information about Philadelphia and a description of the instrumentation used are included. (Author)

PB-194 881
National Air Pollution Control Administration, Raleigh, N.C.
KANAWHA VALLEY AIR POLLUTION STUDY.

Mar 70, 371p APTD-70-1
Prepared in cooperation with West Virginia Air Pollution Control Commission. Errata sheet inserted.

Descriptors: (*Air pollution, *Regional planning), (*West Virginia, Air pollution), Environmental surveys, Valleys, Meteorological data, Odors, Plants (Botany), Atmospheric corrosion, Economics, Particles, Combustion products, Exhaust gases, Industrial wastes, Electric power plants, Monitors, Incinerators, Atmospheric circulation.
Identifiers: Kanawha Valley, Kanawha County (West Virginia), Air pollution detection, Plant damage, Air pollution control equipment.

The aim was to collect and assemble data and information as a basis for technical and official action needed to attain and conserve a desirable air quality in Kanawha Valley, West Virginia. The joint study was conducted from August 1964 through December 1966 and included: (1) measurement of air quality; (2) measurement and description of meteorological parameters; (3) odor studies; (4) collection and evaluation of existing information; (5) pollutant emission inventory; (6) study of materials deterioration; (7) study of means and economics of pollution control; and (8) special studies on vegetation, health, public attitudes, and pollutants not routinely measured. The results of the first seven activities are included. Preliminary results of the studies in vegetation, health and attitudes were considered in developing the Air Resource Management Program. (Author)

PB-195 683
Havens and Emerson, Cleveland, Ohio.
FEASIBILITY OF A STABILIZATION-RETENTION BASIN IN LAKE ERIE AT CLEVELAND, OHIO.

May 68, 194p W71-00411, FWQA-11020-05/68
Contract DI-14-12-27

Descriptors: (*Waste water, Settling basins), (*Settling basins, Great Lakes), Water treatment, Biochemical oxygen demand, Sedimentation, Stabilization, Cost estimates, Water quality, Abatement, Feasibility, Ohio.
Identifiers: *Cleveland (Ohio), *Lake Erie.

A feasibility study was conducted of a large stabilization-retention basin to be constructed in Lake Erie at Cleveland, Ohio. The stabilization is viewed as a possible alternative to separation of a combined sewer system. The proposed basin would treat flows from a number of large combined sewer overflows, from several polluted streams, and effluent from a large secondary wastewater treatment plant. Treatment would consist of bio-oxidation, sedimentation, stabilization and disinfection. The chemical, biological, physical and structural aspects of the proposed basin were studied, and the probable benefits to water quality and the effectiveness of the basin as a treatment device were evaluated. Estimates of cost of the basin and collection system were prepared, and it was concluded that the stabilization basin would provide a higher degree of pollution abatement than would separation of sanitary and storm sewers, at about one-third the cost. (WRSIC abstract)

PB-195 142
National Center for Air Pollution Control, Cincinnati, Ohio.
IRONTON, OHIO - ASHLAND, KENTUCKY - HUNTINGTON, WEST VIRGINIA. AIR POLLUTION ABATEMENT ACTIVITY.
Technical rept. Sep 65-Aug 67.

May 68, 86p APTD-68-2
Report on Pre-Conference Investigations.

Descriptors: (*Air pollution, *Urban areas), Abatement, History, Topography, Climatology, Particles, Sulfur dioxide, Hydrogen sulfide, Nitrogen oxides, Exhaust gases, Combustion products, Industrial wastes, Metal, industry, Chemical industry, Portand cements, Dust, Refuse disposal, Atmospheric motion, Temperature inversions, Ohio, Kentucky, West Virginia.
Identifiers: *Ironton (Ohio), *Ashland (Kentucky), *Huntington (West Virginia), Soiling index, Open burning.

An extensive area survey of air pollution was conducted in the Ironton, Ohio; Ashland, Kentucky; Huntington, West Virginia region for the period of September 1965 to August 1967. The following topics are discussed: topography; climate; materials deterioration; industrial, municipal, and private emission sources; geographic distribution of pollutants; and measurement methods and locations. The pollutants of interest were particulates, NOx, SOx, and H2S. An emission inventory is included, along with discussions of some of the major pollution sources. (Author)

PB-195 143
Scott Research Labs., Inc., San Bernardino, Calif.
EFFECTS OF GASOLINE ADDITIVES ON CARBURETOR AND PCV SYSTEM PERFORMANCE AS THEY RELATE TO EXHAUST EMISSIONS.
First year rept.

30 Apr 70, 89p APTD-0591

Descriptors: (*Air pollution, *Exhaust gases), (*Fuel additives, Air pollution), Field tests, Gasoline engines, Carburetors, Automobiles, Manufacturers, Spark ignition engines.
Identifiers: *Positive crankcase ventilation, Automobile exhausts, PCV (Positive Crankcase Ventilation).

Three groups of 16 cars each or a total of 48 fleet vehicles will be driven in normal urban and suburban modes of operation over a 24,000 mile interval under controlled fuel conditions and maintenance. Each group of 16 cars is being operated on the same base fuel. Two of the three group's test fuels contain a gasoline additive which is added to the base fuel. Exhaust emission measurements were made as the vehicles started the test and at each subsequent 4,000 mile interval. An analysis of variance was conducted on each of the 19 emission parameters for the zero and 4,000 mile interval. A major conclusion reached on the basis of these analyses is that: no significant differences in emission parameters were determined at the 4,000 mile point on the basis of fuel employed. A secondary conclusion drawn concerns the make factor. That conclusion is: all emissions parameters vary significantly between makes; however, no single make is consistently the highest or lowest valued across the spectrum of the 19 emissions parameters measured. The VW vehicles were distinctly different to such a degree that their data were not included in the final analysis. (Author)

PB-195 144
National Air Pollution Control Administration, Durham, N.C.
PARKERSBURG, WEST VIRGINIA - MARIETTA, OHIO, AIR POLLUTION ABATEMENT ACTIVITY.
Supplemental technical rept. Mar 67-Aug 69.

Sep 69, 73p APTD-69-50

Descriptors: (*Air pollution, *Regional planning), (*Industrial wastes, Air pollution), (*Chemical industry, Air pollution), Abatement, Ohio, West Virginia, Topography, River basins, Sulfur dioxide, Chlorine, Particles, Fluorides, Odors, Lachrymators, Plants (Botany), Refuse disposal, Atmospheric motion, Combustion products, Chemical industry, Metal industry.
Identifiers: *Parkersburg (West Virginia), *Marietta (Ohio), *Plant damage, Eye irritants, Air pollution detection.

The report is based on an investigation of air pollution in the Parkersburg, West Virginia - Marietta, Ohio area for the period March 1967 to August 1969 and has been prepared as a supplement to the March 1967 technical report. Together these two reports are intended to assist the governmental agencies concerned with such air pollution in their consideration of the following: The occurrence of air pollution subject to abatement; The adequacy of measures taken toward abatement of pollution; The nature of the delay, if any, in abating pollution; and The necessary remedial action, if any. (Author)

PB-195 145
National Air Pollution Control Administration, Durham, N.C.
CHATTANOOGA, TENNESSEE - ROSSVILLE, GEORGIA INTERSTATE AIR QUALITY STUDY 1967-1968,
Grady T. Helms, James H. Southerland, Kenneth R. Woodard, Ibrahim J. Hindawi, and Dale H. Coventry. Oct 70, 122p APTD-0583

Descriptors: (*Air pollution, *Urban areas), (*Munitions industry, Air pollution), Army, Tennessee, Georgia, Particles, Nitrogen dioxide, Nitrogen oxide, Sulfur dioxide, Carbon monoxide, Atmospheric corrosion, Hydrocarbons, Exhaust gases, Combustion products, Sulfates, Ammonium compounds, Climatology, Refuse disposal, Vegetation, Nitric acid, Sulfuric acid, Industrial wastes, Nitrates.
Identifiers: *Chattanooga (Tennessee), *Rossville (Georgia), *Plant damage, Soiling index.

In 1965, the U.S. Army reactivated the Volunteer Army Ammunition Plant at nearby Tyner, Tennessee, to produce explosives needed for defense. Shortly thereafter numerous complaints of particulate and gaseous emissions were received by various governmental officials from many irate citizens in the surrounding area. On October 1, 1967, an air quality survey was begun in the Chattanooga, Tennessee - Rossville, Georgia, interstate area to fulfill both the request of the Department of Defense and the City of Chattanooga. Four other investigations were conducted in the area during the period from October 1967 through April 1969: (1) meteorological measurements; (2) vegetation effects measurements; (3) materials effects studies; and (4) emissions survey. This report concerns these investigations and their results. (Author)

PB-195 149
National Air Pollution Control Administration, Cincinnati, Ohio.
OPTICAL MICROSCOPY AS APPLIED TO AIR POLLUTION STUDIES. A REFERENCE LIST,
James S. Ferguson, and Eleanor G. Sheridan. Mar 68, 15p APTD-68-3

Descriptors: (*Air pollution, *Particles), (*Microscopy, Air pollution), Bibliographies.
Identifiers: *Air pollution detection.

The bibliography is divided into two categories: (1) 45 general reference books and pamphlets for the review of basic material and for the development of ideas potentially applicable to airborne particulates and (2) 72 journal and symposia proceedings involving microscopy in various areas of interest, but primarily applicable to air pollution. (Author)

PB-195 151
National Center for Air Pollution Control, Cincinnati, Ohio.
DESIGN OF A SIMPLE PLANT EXPOSURE CHAMBER.
Walter W. Heck, John A. Dunning, and Henry Johnson. 1968, 24p APTD-68-6

Descriptors: (*Air pollution, *Test chambers), (*Environment simulators, Air pollution), (*Plants (Botany), Air pollution), Exposure, Design, Gas distribution, Toxicity, Ozone, Humidity, Temperature, Light (Visible radiation), Air flow, Gas flow, Construction, Cost.

The chambers used in plant exposure studies at the National Center for Air Pollution Control utilize a dynamic, negative-pressure, single-pass flow system with uniformity of toxicant flow, mixing, and distribution in the chamber. The simple design, described herein, permits easy installation of numerous chambers in a single air-handling system while still permitting individual control of chambers. (Author)

PB-195 155
National Air Pollution Control Administration, Durham, N.C.
AIR QUALITY DATA FROM THE NATIONAL AIR SURVEILLANCE NETWORKS AND CONTRIBUTING STATE AND LOCAL NETWORKS 1966 EDITION.
1968, 167p APTD-68-9

Descriptors: (*Air pollution, *Urban areas), (*Particles, Air pollution), (*Radioactive contaminants, Air pollution), (*Metals, Air pollution), (*Rural areas, Air pollution), Concentration (Composition), Tables (Data), Hydrocarbons, Aromatic compounds, Sulfur dioxide, Nitrogen oxide (NO), District of Columbia, Carbon monoxide, Seasonal variations, Nitrogen dioxide, Pyrenes, Ammonium compounds, Sulfates, Diurnal variations, Antimony, Beryllium, Bismuth, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Magnesium, Molybdenum, Nickel, Tin, Titanium, Vanadium, Zinc.
Identifiers: Continuous air monitoring projects, Soiling index, National air sampling network, Chicago (Illinois), Cincinnati (Ohio), Denver (Colorado), Philadelphia (Pennsylvania), Saint Louis (Missouri).

Summaries and analyses in addition to basic data tabulations are presented. National summaries of pollutant levels, and figures illustrating variations in the levels of gaseous pollutants are presented. Data are given on the following topics: suspended particulates; organic particulates; radioactivity; nonmetallic inorganic particulates; metals; soiling index; gaseous pollutants; and measurements from the Colorado State network. (Author)

PB-195 156
National Air Pollution Control Administration, Durham, N.C.
MOTOR VEHICLE EXHAUST EMISSIONS - GARY, INDIANA,
C. R. Rehmann. 1968, 27p APTD-68-5

Descriptors: (*Air pollution, *Exhaust gases), (*Urban areas, Air pollution), Carbon monoxide, Hydrocarbons, Nitrogen oxides, Sulfur oxides, Crankcase fumes, Evaporation, Indiana.
Identifiers: *Gary (Indiana), Automobile exhausts.

The results of the motor-vehicle exhaust emission inventory are reported by a grid system on a map of the study area and by grids. The total amounts of pollutants (CO, HC, NOx, SOx, and particulates) emitted from motor vehicle exhausts are tabulated. Evaporative losses and crankcase emissions in the study area account for 47 percent of the total hydrocarbon emissions, and exhaust emissions compose the remaining 53 percent. Typical analysis of motor vehicle emissions was used to check these estimates. Three pollutants - carbon monoxide, hydrocarbons, and nitrogen oxides - comprise 99 percent of the total weight of exhaust emissions in the study area. Sulfur oxides and particulates generally compose the greater percentage of the pollution in an industrial-urbanized area; however, these pollutants comprise only a small portion of the total weight of exhaust emissions. These pollutants are significant because of their toxicity, particle size, and secondary reactions involving the formation of aerosols. The combined emission rate of sulfur oxides and particulates is 2,640 pounds per day. If this pollution were distributed over the 41.6 square miles that comprise the land area of the City of Gary, the emission density for these two pollutants would be 63.5 pounds per square mile as compared to the emission density for carbon monoxide of 845.9 pounds per square mile. The vehicle-mile average-speed approach is presently the most accurate method for estimating the emissions from motor vehicle exhausts. The total emission of sulfur oxides and particulates from motor vehicles is small as compared with the three major pollutants. The use of the emission factors based on the fixed-mode cycle does not, therefore, introduce much error in the total weight of pollutants. (Author)

PB-195 159
National Center for Air Pollution Control, Cincinnati, Ohio.
KANSAS CITY, KANSAS - KANSAS CITY, MISSOURI AIR POLLUTION ABATEMENT ACTIVITY. PHASE II. PRE-CONFERENCE INVESTIGATIONS.
Rept. for 1966-67.

Mar 68, 183p APTD-68-1

Descriptors: (*Air pollution, *Urban areas), Abatement, History, Topography, Particles, Exhaust gases, Combustion products, Industrial wastes, Temperature inversions, Meteorological data, Kansas, Missouri, Sulfur dioxide, Metals, Sulfates, Seasonal variations, Hydrocarbons, Carbon monoxide, Refuse disposal, Atmospheric motion, Incinerators.
Identifiers: *Kansas City (Kansas), *Kansas City (Missouri), Soiling index, Open burning.

The report is based upon an investigation of air pollution conducted in the Kansas City area during 1966 and 1967. The report is intended to assist the governmental agencies concerned with such air pollution in their consideration of the following:

Occurrence of air pollution subject to abatement; Adequacy of measures taken toward abatement of pollution; Nature of delay, if any, in abating the pollution; and Necessary remedial action, if any. (Author)

PB-195 160
Hittman Associates, Inc., Columbia, Md.
THE BENEFICIAL USE OF STORM WATER. A SYSTEM STUDY, DESIGN, AND EVALUATION OF THE LOCAL STORAGE, TREATMENT, AND REUSE OF STORM WATER.
Final rept.

Aug 68, 378p HIT-344 W71-00409, FWQA-11030-DNK-08/68
Contract DI-14-12-20

Descriptors: (*Water supplies, *Maryland), (*Surface water runoff, Water supplies), (*Water treatment, Surface water runoff), Storm sewers, Water consumption, Water treatment devices, Mathematical analysis, Water quality.
Identifiers: *Columbia (Maryland), *Water treatment plants.

The report covers the work performed on the collection, storage, treatment, and reuse of storm water as a means of pollution control and water supply augmentation. A discussion is presented of the work performed in the analysis and optimization of the system; the conceptual designs of potable, sub-potable, and pollution control systems; the conceptual design of a system for controlling pollution using a 'conventional design' approach, the results of the system evaluation and plans for the demonstration of the local storage, treatment, and reuse of storm water. The appendices to this report include the derivations of the hydrology equations, survey reports on water usage and the public acceptance and legal aspects of reuse, design reports on the 'conventional' and demonstration system, detailed estimates on the cost of the demonstration program, and descriptive information on packaged water treatment plants. (Author)

PB-195 161
Armco Steel Corp., Middletown, Ohio.
TREATMENT OF WASTE WATER-WASTE OIL MIXTURES.

May 70, 151p W71-00410, FWPCA-12010-EZV-02/70
Grant WPRD-169-01-68
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.50 as 167.13/4: 12010EZV02/70.

Descriptors: (*Water pollution, *Oils), (*Metal industry, Water pollution), (*Industrial wastes, Water pollution), Lubricating oils, Iron and steel industry, Cold rolling, Coagulation, Polyelectrolytes, Flocculating, Flotating, Emulsification, Zeta potential, pH.
Identifiers: *Waste water treatment, *Water pollution control, *Oil pollution.

Cold reduction of steel strip results in the production of large quantities of waste water containing variable amounts of oil. A five stand tandem cold mill located at Armco Steel Corporation's Ashland, Kentucky Works produces 200 to 500 gpm of waste water containing 400 to 4,000 ppm of oil. The COD of the waste varies from 400 to 20,000 ppm. A treatment process and facility was developed, constructed, and demonstrated, on full scale, for the treatment of cold mill wastes. The treatment process utilized chemical coagulation to break the emulsions. The chemicals employed included alum, lime, clay and organic polyelectrolyte. The process consisted of the following treatment steps; equalization, chemical addition and rapid mixing, flocculation, and dissolved air flotation. Zeta potential, streaming current, and particle size distribution were used in laboratory studies to describe the effect of the following variables on process kinetics; acid number, initial oil concentration, type of emulsifier, chemical dosage, order of chemical addition, reaction time, and final pH. Based on these studies, an hypothesis of the emulsion breaking mechanism was proposed. Oil, COD, and turbidity were used in field studies to establish the effect of the following variables on treatment efficiency; chemical concentration, order of chemical addition, chemical mixing time, flocculation mixing time and speed, and air flotation time and recirculation rate. Based on these studies, design criteria and operating costs for this process were presented. (Author)

PB-195 162
Burgess and Niple Ltd., Columbus, Ohio.
STREAM POLLUTION AND ABATEMENT FROM COMBINED SEWER OVERFLOWS, BUCYRUS, OHIO.
Water pollution control series.

Nov 69, 201p FWQA-DAST-32 FWQA-11024-FKN-11/69, W71-00412
Contract FWPCA-14-12-401
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.00 as 167.13/4: 11024FKN11/69.

Descriptors: (*Water pollution, *Sewage), (*Combined sewers, Water pollution), (*Storm sewers, Water pollution), Flow control, Overflows, Abatement, Sampling, Biochemical oxygen demand, Sediments, Coliform bacteria, Lagoons (Ponds), Chlorination, Sewage treatment, Monitors, Rainfall, Ohio.
Identifiers: *Sandusky River, *Bucyrus (Ohio), *Water pollution control.

The report contains the results of a detailed engineering investigation and comprehensive technical study to evaluate the pollutional effects from combined sewer overflows on the Sandusky River at Bucyrus, Ohio and to evaluate the benefits, economics and feasibility of alternate plans for pollution abatement from the combined sewer overflows. The City of Bucyrus is located near the upper end of the Sandusky River Basin which is tributary to Lake Erie. Bucyrus has an incorporated area of about 2,340 acres, a population of 13,000, and a combined sewer system with an average dry weather wastewater flow of 2.2 million gallons per day. A year long detailed sampling and laboratory analysis program was conducted on the combined sewer overflows in which the overflows were measured and sampled at 3 locations comprising 64% of the City's sewered area and the river flow was measured and sampled above and below Bucyrus. (Author)

PB-195 168
Cornell, Howland, Hayes and Merryfield, Corvallis, Oreg.
ROTARY VIBRATORY FINE SCREENING OF COMBINED SEWER OVERFLOWS.
Water pollution control research series.

Mar 70, 82p FWQA-DAST-5 W71-00476, FWQA-11023-FDD-03/70

Descriptors: (*Storm sewers, *Strainers), Performance, Rotation, Solids, Removal, Pipes, Sewage treatment, Cost effectiveness, Surface water runoff, Combined sewers, Design, Feasibility.
Identifiers: *Rotary screens.

The objective of this study was to determine the feasibility, effectiveness, and economics of employing high-rate, fine-mesh screening for primary treatment of storm water overflow from combined sewer systems. The final form of the screening unit stands 63 inches high and has an outside diameter of 80 inches. The unit is fed by an 8-inch pipe carrying 1700 gpm (122 gal/min/sq ft) which is distributed to a 60-inch diameter rotating (60 rpm) stainless steel collar screen having 14 square feet of available screen area and a 165 mesh (105 micron opening, 47.1 percent open area). The screen is backwashed at the rate of 0.235 gallons of backwash water per 1000 gallons of applied sewage. Based on final performance tests run on dry-weather sewage, the unit is capable of 99 percent removal of floatable and settleable solids, 34 percent removal of total suspended solids and 27 percent removal of COD. The screened effluent is typically 92 percent of the influent flow. On the basis of a scale-up design of a 25 mgd screening facility, the estimated cost of treatment is 22 cents/1000 gallons.

PB-195 169
Merrimack Coll., North Andover, Mass.
PROPOSED COMBINED SEWER CONTROL BY ELECTRODE POTENTIAL,
Water pollution control research series.

Feb 70, 79p W71-00479, FWQA-11024-DOK-02/70

Descriptors: (*Water pollution, *Sewage), (*Flow control, *Electrodes), (*Storm sewers, Flow control), (*Combined sewers, Flow control), Overflow, Water analysis, Biochemical oxygen demand, Phosphorus, Nitrates, Chlorides.
Identifiers: *Water pollution control.

The effectiveness was investigated of electrode potential measurements to modulate discharges from combined and storm sewer overflows to reduce stream and estuarine pollution. Studies included varying the composition of sewage, flow rate and examining the tendency to polarize or coat the electrodes under actual flow conditions. The analysis of experimental results shows a high degree of correlation between the electrode potential of the sewage and its strength. Linear correlation coefficients between electrode potential were determined for BOD, COD, SULFIDES, TOTAL PHOSPHORUS, NITRATES, AND CHLORIDES. It was demonstrated that the potential will be more negative the greater the S (-2) concentration, except when a small amount of DO is present which exerts an attenuating influence. Flows carrying substantial concentrations of reducing substances with a detrimental impact on the dissolved oxygen reservoir of any receiving waters must be kept from exerting their damaging influence on bathing beaches, tidal estuaries and other water resources. Controlling the flow from outfalls by the electrode potential should significantly help to minimize such insults to the environment. (Author)

PB-195 170
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.
LEGAL ASPECTS OF WATER STORAGE FOR FLOW AUGMENTATION,
William R. Walker, and William E. Cox. Aug 70, 231p W71-00480, FWQA-1609-OFPW-03170
Grant FWPCA-WP-01087

Descriptors: (*Water storage, *Water law), Reservoirs, Water quality, Water flow, Law (Jurisprudence).

Enabling legislation for storage of water in Federal reservoirs for supply purposes and quality control through low-flow augmentation includes the Water Supply Act of 1958, the Watershed Protection and Flood Prevention Act, and the 1961 Amendment to the Federal Water Pollution Control Act. The Flood Control Act of 1944 and the Federal Water Power Act also have possible applicability. The enabling legislation and other law defining the operating procedure of the federal water resource agencies make water supply and water quality storage somewhat dependent on the provisions of state water law. State law may affect the acquisition of water rights for storage and the procedure whereby it is applied to its intended functions. The impact of state law on the acquisition process varies according to whether water rights are acquired by the United States or by a private party. When private interests are responsible, as in the case of

water supply storage in Corps of Engineers and Soil Conservation facilities, the aquisition of rights is not as complex as when a Soverign is involved. Aquisition of water rights by the federal government gives rise to federal-state jurisdictional problems and several unresolved questions concerning water rights. (WRSIC abstract).

PB-195 172
National Air Pollution Control Administration, Durham, N.C.
AIR POLLUTANT EMISSION INVENTORY OF NORTHWEST INDIANA; A PRELIMINARY SURVEY 1966,
Guntis Ozolins, and C. Rehmann. Apr 68, 43p
APTD-68-4

Descriptors: (*Air pollution, *Urban areas), (*Metal industry, Air pollution), (*Refineries, Air pollution), Indiana, Combustion products, Industrial wastes, Exhaust gases, Refuse disposal, Particles, Hydrocarbons, Sulfur dioxide, Chemical industry, Iron and steel industry, Petroleum industry, Carbon dioxide, Nitrogen oxides, Electric power plants, Coal.
Identifiers: *East Chicago (Indiana), *Gary (Indiana), *Whiting (Indiana), *Hammond (Indiana), Open burning.

Sources of air pollutant emissions were surveyed to quantify the total pollution load emitted to the air over the Northwest Indiana communities of East Chicago, Gary, Hammond, and Whiting. The emissions are reported on an annual basis and subdivided into five major pollutants: particulates, sulfur oxides, nitrogen oxides, hydrocarbons, and carbon monoxide. The four major source categories that were utilized in reporting emissions from area and point sources are: fuel combustion in stationary sources, fuel combustion in mobile sources, combustion of refuse, and industrial process losses. The results of this survey are reported by city and illustrated on the grid system established by the Northwest Indiana Air Resource Management Program. (Author)

PB-195 195
Federal Water Quality Administration, Athens, Ga. National Pollutants Fate Research Program.
THE INTERRELATION OF CARBON AND PHOSPHORUS IN REGULATING HETEROTROPHIC AND AUTOTROPHIC POPULATIONS IN AQUATIC ECOSYSTEMS.
Water pollution control research series,
Pat C. Kerr, Doris F. Paris, and D. L. Brockway.
Jul 70, 60p FWQA-16050-FGS-07/70 W71-00475
Presented at Purdue Industrial Wastes Conference May 6, 1970. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.60 as I-67.13/4:16050-FGS-07/70.

Descriptors: (*Ecology, *Streams), (*Carbon, *Food chains), (*Phosphorus inorganic compounds, Food chains), Stream pollution, Water pollution, Algae, Fresh water biology, Nitrogen, Metabolism, Water chemistry, Water pollution, Bacteria, Aquatic biology.

Laboratory and field investigations were conducted on the fate and cycling of carbon and phosphorus in selected aquatic ecosystems. Inorganic carbon, as CO2, supplied by both bacterial cultures and cylinder gases, stimulated the growth of the blue-green alga Anacystis nidulans. Diel studies of a stream which received biologically-treated sewage demonstrated that the dissolved CO2 and HCO3 continually produced in the system were essentially depleted by the autotrophic organisms during daylight hours, while the concentration of phosphorus remained unchanged. Addition of organic carbon and inorganic nitrogen and phosphorus alone and in combination to the waters studied directly stimulated the oxidative metabolism of the heterotrophic population, which resulted in increased dissolved CO2 and HCO3. This increased availability of inorganic carbon, rather than the direct metabolic removal of dissolved phosphorus by the algae, appeared to be directly responsible for the growth of the algal populations in the waters studied. (Author)

PB-195 200
Rex Chainbelt, Inc., Milwaukee, Wis.
TREATMENT OF ACID MINE DRAINAGE BY REVERSE OSMOSIS.
Mar 70, 42p FWPCA-14010-DYK-03/70, W71-00477
Grant FWPCA-14010-DYK
Prepared in cooperation with the Commonwealth of Pennsylvania Department of Mines and Mineral Industries. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.55 as I67.13/4: 14010DYK03/70.

Descriptors: (*Mine waters, *Osmosis), (*Water pollution, Mine waters), (*Water treatment, Mine waters), (*Demineralizing, Osmosis), Membranes, Field tests, Calcium inorganic compounds, Sulfates, Magnesium inorganic compounds, Iron inorganic compounds, Water supply.
Identifiers: *Mine acid drainage, *Reverse osmosis, *Water pollution control.

The report documents a study on the treatment of acid mine drainage by reverse osmosis. The objective of the study was to determine the feasibility of utilizing reverse osmosis to abate pollution due to acid mine drainage, and produce a water which could be used by industry or as a municipal water supply. A test site in Shickshinny, Pennsylvania was selected as a source of acid mine water for the study. A sample of this water was tested in a laboratory reverse osmosis unit to determine the design parameters for a 10,000 gallon per day demonstration unit. The results obtained during the demonstration period indicated that the reverse osmosis process has potential application in acid mine drainage treatment. A high quality water was produced which was suitable for use by industries or municipalities with a minimum of additional treatment. There are, however, operational problems which must be solved prior to utilizing reverse osmosis on a large scale. These include maintenance of high permeation rates through the membrane by reducing membrane fouling and determination of the optimum flow sheet for an acid mine treatment system utilizing reverse osmosis. (Author)

PB-195 201
Hayes, Seay, Mattern and Mattern, Roanoke, Va.
ENGINEERING INVESTIGATION OF SEWER OVERFLOW PROBLEM.
A detailed investigation into the cause and effect of sanitary sewer overflows and recommended remedial measures for Roanoke, Virginia,
Wendle R. Snapp, and Robert A. Lemon. May 70, 250p FWPCA-11024-DMS-05/70, W71-00478
Contract FWPCA-14-12-200
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.00 as I67.13/4: 11024-DMS-05/70.

Descriptors: (*Sewers, Fluid infiltration), (*Storms, Surface water runoff), Overflows, Sewage, Rainfall intensity, Computer programming, Design, Cost estimates, Sampling, Water pollution, Control, Virginia.
Identifiers: *Roanoke (Virginia).

Results are given of investigations, on 25 percent of Roanoke, Virginia's separate sanitary sewerage system, on the amounts of infiltration for various storm intensities and durations and the amounts of sewage overflow from the system. From these results the system was analyzed, using an in-house developed computer program, to assess the magnitudes and frequencies of overflows. The generated data from the analysis were used to develop an optimum design for remedial measures to reduce sewer overflows. Costs estimates are presented for the various items of work involved. (Author)

PB-195 223
FMC Corp., Santa Clara, calif. Central Engineering Labs.
FEASIBILITY OF A PERIODIC FLUSHING SYSTEM FOR COMBINED SEWER CLEANSING.
Final rept., Phase I.

Aug 67, 63p* FMC-R-2608 FWPCA-11020-DNO-08/67, W71-00623
Contract FWPCA-14-12-19

Descriptors: (*Combined sewers, *Flushing), Surface water runoff, Storms, Pollution, Test equipment, Design, Cost analysis, Cleaning, Feasibility, Automatic control.

One of the causes of pollution from stormwater overflow of combined sewers is the deposition of pollutional solids during dry weather flow followed by pick up of the pollutional material during storm flow when the flow be bypassed. As a solution to this problem, it has been proposed that a flushing system be used to periodically cleanse the sewers during dry weather and convey the solids to the treatment plant. A study was made of sewer flushing practices, application requirements, and hydraulic theory. Investigation was also made of sampling methods and equipment; flushing test equipment was designed and the cost was estimated. The existing information on sewer flushing has indicated a good possibility that a periodic flushing system would be feasible for reducing pollution from combined sewer stormwater overflow. The design of flushing evaluation equipment has been carried to the point that cost estimates can be made for construction of the equipment. A description of the design and the cost estimates are included. (WRSIC abstract)

PB-195 257
Dunlap and Associates, Inc., Darien, Conn.
A STUDY OF COMFORT, HEALTH AND LEARNING IN SCHOOLS WITH DIFFERING THERMAL CONDITIONS.
Final rept.,
Aug 70, 122p* ED-70-41 APTD-0590
Contract PHS-CPA-22-69-123

Descriptors: (*Schools, *Temperature control), (*Students, Performance evaluation), (*Instructors, Performance evaluation), Learning, Health, Comfort, School buildings, Temperature measurement, Statistical analysis.
Identifiers: *Climate controlled schools, Absenteeism.

The objective was to obtain data on the effects of thermal conditions on comfort (teacher and students), class behavior, student test performance and health (visits to health room and absences) in both climate controlled and non-climate controlled schools. Data were collected by teachers in three classrooms of each of six schools--two grade schools, two junior high schools, and two high schools. (Author)

PB-195 281
Avco Economic Systems Corp., Washington, D.C.
STORM WATER POLLUTION FROM URBAN LAND ACTIVITY.
Water pollution control research series.

Jul 70, 342p* W71-00619, FWQA-11034-FKL-07/70
Contract DI-14-12-187
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $2.00 as I67.13/4:11034FKL.

Descriptors: (*Water pollution, *Surface water runoff), (*Storm sewers, Water pollution), Drainage, Urban areas, Abatement, Industrial wastes, Sewage, Nutrients, Coliform bacteria, Biochemical oxygen demand, Sediments, Phosphates, Nitrogen inorganic compounds, Chlorides, pH, Topography, Sampling, Oklahoma.
Identifiers: *Water pollution control, *Tulsa (Oklahoma).

An investigation of the pollution concentrations and loads from storm water runoff in an urban area was conducted in Tulsa, Oklahoma. The scope of the project included: a field assessment of the storm water pollution by obtaining samples of the water resulting from precipitation and surface runoff from selected test areas within the metropolitan area; development of an analytical procedure for correlation of storm water pollution with selectively defined variables of land uses, environmental conditions, drainage characteristics, and precipitation; and development of a plan for implementing remedial measures necessary to abate or control sources of pollution in an urban area. Storm water runoff samples were collected from 15 'discrete' test areas in the Tulsa metropolitan area for laboratory analysis in terms of quality standards for BOD, COD, TOC, organic Kjeldahl nitrogen, soluble orthophosphate, chloride, pH, solids, total coliform, fecal coliform, and fecal streptococcus pollutants. Selected land use parameters, environmental conditions, drainage and precipitation data, along with storm water pollution factors, provided input data for functional relationships to enable assessment of pollution from storm water runoff. Recommendations were made for a plan of action for preventing and controlling storm water pollution from urban areas. (Author)

PB-195 282
Bituminous Coal Research, Inc., Monroeville, Pa.
STUDIES ON LIMESTONE TREATMENT OF ACID MINE DRAINAGE.
Water pollution control research series.

Jan 70, 106p* FWPCA-DAST-33 W71-00620, FWPCA-14010-EIZ-01/70
Grant FWPCA-14010-EIZ, FWQA-63-01-68
Report on Optimization and Development of Improved Chemical Techniques for the Treatment of Coal Mine Drainage. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. $1.25 as I67.13/4DAST33.

Descriptors: (*Coal mining, Mine waters), (*Water pollution, Mine waters), (*Mine waters, *Neutralizing), Drainage, Limestone, Particle size, pH, Particle shape, Calcium, Magnesium, Activated carbon, Zeta potential, Iron inorganic compounds, Magnetic separators, Sludge, Precipitates, Coagulation, Oxidation, Hydroxides, Pilot plants.
Identifiers: *Mine acid drainage, *Water pollution control, Iron hydroxides.

Four actual coal mine waters have been neutralized with limestone both on a batch scale and by utilizing a continuous flow apparatus. Variations in treatment procedure were necessary depending on the characteristics of the individual waters. A standardized test was established to evaluate the reactivity of the limestones. The following variables are of importance in evaluating limestones for coal mine water neutralization: (a) particle size, (b) Ca and Mg content, and (c) surface area. Ferrous iron oxidation has been accomplished with both synthetic and actual coal mine water at low pH in the presence of coal-derived activated carbon. Electrophoretic mobility studies on precipitates obtained by both lime and limestone neutralization of coal mine water yielded information which can be applied for more effective sludge removal. Magnetic sludges were prepared using two different iron-bearing waters. The conversion of precipitates to a magnetic form results in significant reductions in settled sludge volumes as well as increases in solids content. Data obtained in these studies indicate that the limestone process offers considerable promise for an improved lower cost method for treating several types of coal mine waters. (Author)

PB-195 283
Melpar, Falls Church, Va. Environmental and Applied Science Center.
OIL TAGGING SYSTEM STUDY.
Water pollution control research series.

May 70, 121p* Melpar-9059, FWPCA-DAST-11 W71-00624, FWQA-15080-DJQ-05/70
Contract FWPCA-14-12-500
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. $1.50 as I67.13/4:15080DJ05/70.

Descriptors: (*Water pollution, *Oils), (*Marking, Oils), (*Law enforcement, Water pollution), Identifying, Coding, Halohydrocarbons, Organometallic compounds, Particles, Aromatic polycyclic hydrocarbons, Cost estimates, Weathering, Photochemical reactions, Decomposition, Chemical analysis, Gas chromatography, Crude oil.
Identifiers: *Oil pollution, *Forensic chemistry, *Water pollution detection.

Several methods of identifying the source of oil pollution are critically examined. These methods are grouped into two categories: passive tagging and active tagging. Passive tagging assumes that oils are so chemically diverse that their contents constitute a stable chemical fingerprint that can be unequivocally disclosed in the laboratory. Active tagging requires that an inexpensive, coded material be added to oil; this material must be chemically and physically stable in both oil and oil slicks; it must also be readily identifiable by available analytical techniques; and it must have no adverse effect on the oil's subsequent use. Three methods of passive tagging (trace metals, sulfur-isotope ratios, and paper chromatography) and three methods of active tagging (halogenated polycyclic aromatics, organometallics, and coded microspheroids) have been examined. Passive tags cannot be recommended because the passive tags are quite likely to mingle, to evaporate, to be dissolved, or to be oxidized; even if these processes do not occur, they can create formidable forensic problems for the prosecution and telling counter-arguments for the defense. Since active tags are designed to be stable and identifiable, they are satisfactory for the job; and the three types of active tags reviewed show promise and merit. (Author)

PB-195 338
Research Corp. of New England, Hartford, Conn.
A STUDY OF INDOOR-OUTDOOR AIR POLLUTANT RELATIONSHIPS. VOLUME I AND II.
Final rept.,
John Yocom, William L. Clink, and William A. Cote. May 70, 159p* APTD-0592
Contract PHS-CPA-22-69-14

Descriptors: (*Buildings, *Air pollution), (*Houses, Air pollution), Aerosols, Dust, Particles, Carbon monoxide, Sulfur dioxide, Seasonal variations, Penetration, Diurnal variations, Lead inorganic compounds, Gas sampling, Ventilation, Vehicular traffic, Office buildings, Urban areas, Concentration (Composition).
Identifiers: *Indoor air pollution, Soiling index, Hartford (Conneticut).

The report presents the results of a series of sampling programs conducted at three pairs of buildings in central Hartford and in East Hartford. The object of the study was to measure concentrations of four different pollutants (suspended particulate matter, soiling particulate matter, carbon monoxide and sulfur dioxide) simultaneously and to evaluate various building parameters that may effect indoor-outdoor relationships. In a related study, carbon monoxide was measured inside and outside of a pair of gas fueled homes and, additionally, sulfur dioxide and soiling particulates at a pair of coal fueled homes. (Author)

PB-195 433
Stanford Research Inst., Irvine, Calif.
THE BIOSPHERE AS A POSSIBLE SINK FOR CARBON MONOXIDE EMITTED TO THE ATMOSPHERE.
Final rept.,
Elaine A. Levy. May 70, 37p* CRC-CAPA-4-68
Contract PHS-CPA-22-69-43

Descriptors: (*Air pollution, Carbon monoxide), (*Atmospheric concentration, *Carbon monoxide), (*Plants (Botany), Carbon monoxide), Combustion products, Algae, Soil microbiology, Aquatic plants.
Identifiers: *Biosphere.

The report describes studies conducted to determine the possibility of certain elements in the biosphere serving as sinks for carbon monoxide emitted to the atmosphere by various human activities. This was accomplished by exposing test samples to 100 ppm carbon monixide (static experiments). (Author)

PB-195 544
State Univ. of New York, Buffalo. Faculty of Engineering and Applied Sciences.
DYNAMIC MODEL STUDY OF LAKE ERIE. PART I. SIMILITUDE CRITERIA AND EXPERIMENTAL SET-UP,
Ralph R. Rumer, Jr. Aug 70, 56p Civil Engineering-18.1 FWPCA-16050-DJK-08/70-pt-1, W71-00621
Grant FWPCA-WP-00837
See also Part 2, PB-195 545.

Descriptors: (*Water flow, Hydraulic models), (*Water pollution, Control), (*Great Lakes, Currents), Simulation, Water quality, Wind, Dilution, Wastes, Mixing, Rivers.
Identifiers: Lake Erie.

Both analytical and experimental investigations are employed to provide basic information concerning water movement in the Lake. The knowledge and experience acquired in the course of this study should improve our capability to construct and operate rotating hydraulic models. This information should also assist in the overall water quality management of the Lake. The studies reported here deal with the idealized conditions of zero wind stress (including the inflow of the Detroit River and the outflow of the Niagara River) and, under this same flow condition, with the superposition of a uniform westerly wind over the surface of the Lake. The water mass is isothermal and variations in density are assumed absent. Under these conditions, investigations of the circulation patterns were conducted. Also studied was the oscillation of the entire water mass in the model lake. In particular, attention was given to the transient effect that this mass oscillation had on the otherwise steady-state circulation pattern and its effect on the mixing and dilution of waste discharges into the lake. (WRSIC abstract)

PB-195 545
State Univ. of New York, Buffalo. Faculty of Engineering and Applied Sciences.
DYNAMIC MODEL STUDY OF LAKE ERIE. PART II. ANALYTICAL AND EXPERIMENTAL RESULTS,
Ralph R. Rumer, Jr. Aug 70, 70p Civil Engineering 18.2 FWPCA-16050-DJK-08/70-Pt-2, W71-00622
Grant FWPCA-WP-00837
See also Part 1, PB-195 544.

Descriptors: (*Water flow, Hydraulic models), (*Water pollution, Control), (*Great Lakes, Currents), Simulation, Mathematical models, Wind, Water quality, Mixing, Dilution, Wastes.
Identifiers: Lake Erie.

The second report considers the experimental results obtained and the relationship of these results to various mathematical model approaches to the hydraulic study of Lake Erie. Based on the experimental and analytical results of this study, the following summarizing statements are made regarding the dynamic behavior of Lake Erie. In the absence of wind, the throughflow caused by the inflow of the Detroit River and the outflow of the Niagara River generates significant currents and easily observable patterns of circulation. The presence of westerly wind significantly alters the circulation pattern of Lake Erie as observed in the absence of wind. A procedure for relating model

wind speeds to prototype wind speeds based on similarity between wind set-up in model and prototype has been presented. (WRSIC abstract)

PB-195 673
Federal Water Quality Administration, College, Alaska. Alaska Water Lab.
BIOLOGICAL WASTE TREATMENT IN THE FAR NORTH,
Sidney E. Clark, Harold J. Coutts, and Conrad Christianson. Jun 70, 54p* W71-01262, FWQA-1610-06/70

Descriptors: (*Sewage treatment, *Arctic regions), (*Activated sludge process, Arctic regions), Reviews, Aeration, Cold weather tests, Lagoons (Ponds), Aerobic processes.

A literature review to establish the state-of-the-are of biological waste treatment for cold regions applications was conducted. Comments were solicited from operating agencies throughout the cold regions of the Northern Hemisphere, particularly in the United States and Canada. These agencies have provided discussion of their experiences and offered their recommendations through letters and other forms of personal communications. The review centers on the feasibility for cold regions application of lagoons (aerated, facultative, and anaerobic) and extended aeration (12 to 36 hour detention activated sludge) with emphasis placed on the effectiveness of processes at low temperatures while treating domestic sewage. Although definite design criteria are not established, many of the recommendations and conclusions provide a better basis for cold regions design of biological waste treatment facilities. The limitations of existing knowledge are expressed and recommendations for continued research are presented. (Author)

PB-195 674
Crane Co., King of Prussia, Pa. Cochrane Div.
MICROSTRAINING AND DISINFECTION OF COMBINED SEWER OVERFLOWS.
WATER Pollution control research series,
George E. Glover, and Peter M. Yatsuk. Jun 70, 82p W71-01263, FWQA-11023-EVO-06/70
Contract FWQA-14-12-136

Descriptors: (*Combined sewers, Overflows), (*Sewage filtration, Cost comparison), Solids, Removal, Surface water runoff, Water quality, Ozone, Chlorine, Coliform bacteria, Biochemical oxygen demand, Disinfection, Drainage, Cost estimates.
Identifiers: Microstrainer screens.

Microstraining (Trade Name), using a Microstrainer screen of a nominal aperture of 23 microns, removed up to 98% of the suspended solids from a combined sewer overflow. The sewer, in a residential area of Philadelphia, has an average dwf of 1,000 gph. The maximum combined sewer flow during rainstorms in one year of operation was 304,000 gph (11.3 cfs). Volatile suspended solids removals with the above screen have averaged 68% and 71% during different test periods. Results indicated that there was a slightly better kill of coliform group bacteria with chlorine than with ozone in the Microstrainer effluents when both were used at an initial nominal concentration of 5 ppm, with 5 to 12 minutes detention time. However, chlorine was applied at slightly higher levels and with better control than ozone. Preliminary estimates of the costs of treatment via Microstraining, using tentatively-established throughput rates, show that the capital costs per acre of drainage would be approximately $10,200 for Microstraining alone, $11,200 for Microstraining plus chlorination, and $19,800 for Microstraining plus ozonation. Of eight other currently-proposed schemes, whose costs were estimate, only surface impoundment (where aesthetically acceptable and where low cost land is available) appears competitive. (Author)

PB-195 675
NUS Corp., Pittsburgh, Pa. Cyrus Wm. Rice Div.
DESIGN OF WATER QUALITY SURVEILLANCE SYSTEMS. PHASE I. SYSTEMS ANALYSIS FRAMEWORK.
Water pollution control research series,
Paul V. Morgan, Brownie R. Johnson, Henry C. Bramer, and Wallace L. Duncan. Aug 70, 317p* W71-01264, FWQA-16090-DBJ-08/70
Contract FWPCA-14-12-476
Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $3.00 as I67.13/4: 16090DBJ08/70.

Descriptors: (*Water quality, *Monitors), (*Water pollution, *River basins), (*Data retrieval, Water pollution), Standards, Law (Jurisprudence), Systems engineering, Data processing, Abatement, Site surveys, Systems analysis, Stream pollution, Ohio, Tennessee, Missouri, State government, National government.
Identifiers: Ohio River Basin, *Tennessee River Basin, *Missouri River Basin, Water pollution detection.

In order to accomplish the goals of the Water Quality Act of 1965, it is necessary to establish water quality surveillance systems throughout the nation. It is highly imperative that the individual systems developed by the various Federal, state, and interstate agencies be compatible and their data systems be interconnected. The various inputs and decisions necessary to accomplish this task are so complex that modern systems analysis techniques should be applied to insure that each of these water quality surveillance systems are developed and designed utilizing the same criteria. This study is the initial effort to apply systems analysis techniques to the solution of this problem. Three major river basins were selected for this study in order to identify the parameters common to any basin throughout the nation. The three basins were studied by: (1) reviewing the literature associated with their water quality characteristics; (2) on-site visits to the river basin areas; (3) comparative review of the interstate water quality standards and plans of implementation; and (4) legal considerations in surveillance program design. These tasks provided the input material to develop a systems analysis framework. The systems analysis framework was applied manually to select sites for water quality surveillance stations on the major streams studied within the three river basins. (Author)

PB-195 676
American Public Works Association, Chicago, Ill. Research Foundation.
COMBINED SEWER REGULATION AND MANAGEMENT. A MANUAL OF PRACTICE.
Water Pollution control research series.

Jul 70, 140p W71-01265, FWQA-11022-DMU-08/70
Contract FWQA-14-12-456
Paper copy available from Superintendant of Documents, GPO, Washington, D.C. 20402. $1.50 I67.13/4:11022DMO 08/70.

Descriptors: (*Combined sewers, *Control equipment), Regulators, Design, Maintenance, Performance, Cost estimates, Overflows, Manuals.
Identifiers: Tide gates.

Design application, operation and maintenance of combined sewer overflow regulator facilities are detailed in this Manual of Practice, developed in conjunction with a report prepared on combined sewer overflow regulators. Design calculations are given for various types of regulators and tide gates. A sample regulator facility control program is given to illustrate the development of a control system. Operation and maintenance guidelines are also given. Thirty-eight sketches and photographs are included. (WRSIC Abstract) (Sullivan-APWA Research Foundation)

PB-195 677
Westinghouse Ocean Research Lab., San Diego, Calif.
BIOLOGICAL EFFECTS OF EFFLUENT FROM A DESALINATION PLANT AT KEY WEST, FLORIDA.
Water pollution control series,
W. D. Clarke, J. W. Joy, and R. J. Rosenthal. Feb 70, 103p W71-01266, FWQA-18080-DAI-02/70
Contract FWQA-14-12-470
Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $1.00 as 167.13/4:18050DAI-02/70.

Descriptors: (*Aquatic biology, Ecology), (*Ecology, *Effluents), (*Salinity, Aquatic biology), (*Desalting, Water pollution), Biomass, Environments, Florida, Tropical regions, Aquatic animals, Aquatic plants, Heat.
Identifiers: *Desalination plants, *Thermal pollution, Key West (Florida).

The Key West study was undertaken to determine the impact of the discharge from a large desalting plant on the surrounding environment. The Phase-I work has shown that some of the properties of the effluent can be detected by physical and chemical measurements well beyond the area that visible effects can be detected in the bottom communities. While the effluent produces some beneficial effects such as attracting certain species of fish and the stone crab, Menippe mercenaria, it has also been shown to have deleterious effects for other organisms. Algae, tunicates, and gastropods were excluded from the near-field of the effluent discharge and bryozoan colonies were not as numerous in the discharge area nor did they grow as well as they did outside of the area. Quantitative investigations of the physiological and ecological effects of the desalting plant effluent in future studies could lead to predictive capabilities as far as the amount of environmental stress that can be tolerated at a given locality. (Author)

PB-195 702
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
A STUDY OF HEAD AND NECK EXPOSURE FROM POLYTOMOGRAPHY.
J. Robert Cassady, and Robert N. Pierce. Nov 70, 18p* BRH/DEP-70-27

Descriptors: (*Radiography, *Radiation hazards), Radiation dosage, X rays, Exposure, Head (Anatomy), Neck (Anatomy), Partial body irradiation.
Identifiers: *Polytomography.

An investigation was conducted to determine radiation exposures to the head and neck regions of patients undergoing polytomographic studies of the sella turcica, paranasal sinuses, and petrous pyramid. The highest exposures were measured at the eyelid region for studies of the sella turcica and paranasal sinuses. In studies of the petrous pyramid, the highest exposures were recorded in the external auditory canals. Variation in the total number of exposures, the ratio of frontal and lateral exposures, and beam collimation are cided as principal causes of the wide range of values recorded for a given dosimeter location and type of examination. To reduce eye exposures, it is recommended that PA rather than AP projections be used for tomography of the petrous pyramid, scila turcica, sphenoid sinus, and other mid- and posteriorly-located structures of the skull. (Author)

PB-195 740
Safety in Mines Research Establishment, Buxton (England).
ANTI-SLIP STUDS FOR SAFETY FOOTWEAR.
Research rept.,
H. T. Ramsay, and C. R. Senneck. 1970, 16p
SMRE-274
Paper copy also available from Ministry of Technology Safety in Mines Research Establish-

ment, Red Hill Land, Sheffield S3 7HQ (England). 4s 5d.

Descriptors: (*Boots (Footwear), Safety), (*Coal mining, Accident prevention), Studs, Tungsten carbides, Friction, Adaptation, Great Britain.
Identifiers: Mine safety.

A large and increasing proportion of the accidents occurring in British mines are caused by men losing their balance, and there is evidence that slipping plays a major part in many such accidents. Simple laboratory measurements of the frictional force between footwear and different floor materials with different surface conditions showed that existing types of miners' footwear did not give a good grip in all circumstances. In particular, although rubber-soled footwear gave an excellent grip on clean surfaces, it gave a very much reduced grip on greasy or muddy surfaces. An unexpected change in grip could cause men to slip. Boots fitted with tungsten carbide tipped studs, such as are fitted to types for motoring on ice, were tested and gave a reasonable grip which was almost unaffected by the condition of the surface. User trials of such studded boots have been encouraging and are being extended, most wearers being enthusiastic about the boots' anti-slip properties. Extensive tests are in progress on the frictional-ignition hazard presented by tungsten carbide tipped studs. It seems likely that the hazard will prove to be in the same low range as that given by hobnails and other steel fittings to footwear. Advice is given on where and how to insert studs into existing footwear and suggestions are made for future developments. The publication of the early results of the work has produced a lot of inquiry from industries other than coalmining and this brief report has been prepared to meet the needs of these other industries. (Author)

PB-195 758
Resources Research, Inc., Washington, D.C.
PROPOSED IMPLEMENTATION PLAN FOR THE CONTROL OF PARTICULATES AND SULFUR OXIDES, FOR THE STATE OF OHIO PORTION OF THE METROPOLITAN CINCINNATI INTERSTATE AIR QUALITY CONTROL REGION.

Sep 70, 229p
Contract PHS-CPA-70-29

Descriptors: (*Air pollution, *Urban areas), (*Sulfurdioxide, Air pollution), (*Particles, Air pollution), (*Regional planning, Air pollution), (*Ohio, Air pollution), Monitors, Regulations, Environmental surveys, Abatement, Budget estimates, Atmospheric diffusion, Combustion products, Meteorological data, Sampling, Law (Jurisprudence), Law enforcement, Cost estimates, State government, Exhaust gases.
Identifiers: *Air pollution control, Air pollution detection, *Cincinnati (Ohio), Metropolitan Cincinnati Interstate Air Quality Control Region, Air pollution episodes.

The report concerns particulate pollutant and SO2 control in the metropolitan Cincinnati region. Contents include: Description of the region; Control plan; Legal authority; Control regulations; Emergency episode authority and procedures; Air quality monitoring; and Resources. Meteorological data, the Ohio Air Pollution Control Law, and regional organizational structures are appended.

PB-195 759
Resources Research, Inc., Washington, D.C.
PROPOSED IMPLEMENTATION PLAN FOR THE CONTROL OF PARTICULATES AND SULFUR OXIDES, FOR THE STATE OF INDIANA PORTION OF THE METROPOLITAN CINCINNATI INTERSTATE AIR QUALITY CONTROL REGION.

Sep 70, 212p APTD-0599
Contract PHS-CPA-70-29

Descriptors: (*Air pollution, *Urban areas), (*Sulfur dioxide, Air pollution), (*Particles, Air pollution), (*Regional planning, Air pollution), Monitors, Regulations, Environmental surveys, Abatement, Budget estimates, Atmospheric diffusion, Meteorological data, Sampling, Law (Jurisprudence), Law enforcement, Cost estimates, State government, Combustion products, Exhaust gases, Ohio.
Identifiers: *Air pollution control, Air pollution detection, *Cincinnati (Ohio), Metropolitan Cincinnati Interstate Air Quality Control Region, Air pollution episodes.

In the report, which concerns the particulate and SO2 control in the metropolitan Cincinnati region, the contents include: Description of the region; Control plan; Legal authority; Control regulations; Emergency episode authority and procedures; Air quality monitoring; and Resources. Meteorological data, the Indiana Air Pollution Control Law, and regional organizational structures are appended. (Author)

PB-195 760
Resources Research, Inc., Washington, D.C.
PROPOSED IMPLEMENTATION PLAN FOR THE CONTROL OF PARTICULATES AND SULFUR OXIDES, FOR THE COMMONWEALTH OF KENTUCKY PORTION OF THE METROPOLITAN CINCINNATI INTERSTATE AIR QUALITY CONTROL REGION.

Sep 70, 241p APTD-0600
Contract PHS-CPA-70-29

Descriptors: (*Air pollution, *Urban areas), (*Sulfur dioxide, Air pollution), (*Particles, Air pollution), (*Regional planning, Air pollution), (*Kentucky, Air pollution), Monitors, Regulations, Environmental surveys, Abatement, Budget estimates, Combustion products, Exhaust gases, Meteorological data, Sampling, Law (Jurisprudence), Law enforcement, Cost estimates, State government.
Identifiers: *Air pollution control, Air pollution detection, *Cincinnati (Ohio), Metropolitan Cincinnati Interstate Air Quality Control Region, Air pollution episodes.

The report concerns particulate pollutant and SO2 control in the metropolitan Cincinnati region. Contents include: Description of the region; Control plan; Legal authority; Control regulations; Emergency episode authority and procedures; Air quality monitoring; and Resources. Meteorological data, the Kentucky Air Pollution Control Law, and regional organizational structures are appended.

PB-195 763
Japanese National Railways, Tokyo (Japan). Railway Technical Research Inst.
QUARTERLY REPORTS: RAILWAY TECHNICAL RESEARCH INSTITUTE, VOLUME 11, NUMBER 3, 1970.

1970, 64p
See also Volume 11, number 2, PB-194 285.

Descriptors: (*Railroads, Research), Railroad bridges, Railroad tracks, Electric railroads, Railroad cars, Steel, Mechanical properties, Rock mechanics, Transmission lines, Power supply circuits, Railroad ballast, Reviews, Periodicals, Japan.

Contents: Modernization of ticket issuing and inspection; Corrosion prevention of track materials; Delayed failure of high strength bolt; The investigation of cutting slopes; Experiments on Arita River railway bridge with the concrete bed; Standing test of eddy current rail brake set to a new test electric car; Computer program for analysis of the feeder circuit with auto-transformers on AC electrified railway; Nondestructive snapping inspection of stranded wire in jumper cable of railway car; Fatigue strength of side fillet welded joint; On the thermal effect of tread braking upon car wheels; A new method of measuring fatigue and fatigue behaviors of plastics; Technical notes.

PB-195 770
Graphic Arts Technical Foundation, Pittsburgh, Pa.
EVALUATIONS OF EMISSIONS AND CONTROL TECHNOLOGIES IN THE GRAPHIC ARTS INDUSTRIES.
Final rept. 28 Apr 69-30 Jun 70 on Phase 1,
R. R. Gadomski, M. P. David, and G. A. Blahut.
Aug 70, 238p* APTD-0597
Contract PHS-CPA-22-69-72

Descriptors: (*Air pollution, *Solvents), (*Printing, Air pollution), (*Air pollution control equipment, Printing), Surveys, Hydrocarbons, Alcohols, Ketones, Chlorine organic compounds, Nitro compounds, Printing inks, Letterpress printing, Lithography, Gravure printing, Flexography, Silk screen printing, Printing papers, Drying, Decorative coatings, Gas sampling, Gas detectors, Adsorption, Incinerators, Activated carbon, Scrubbers, Graphic arts.
Identifiers: *Air pollution detection, *Air pollution control.

A multi-faceted study was conducted to determine the nature of emission problems in the graphic arts and metal decorating industries. By means of field visits and a survey of solvent and ink use, the industry's actual and potential problems were delineated and methods used for solving these were reviewed. An industry sampling plan was developed that will measure and attempt to characterize the emissions, according to the process, type of ink coating and substrate used. Analytical procedures requisite to the chemical evaluation of effluents and sampling technique employed were examined and reviewed. The less complex method of total hydrocarbon analysis suffices for certain segments of the industry. Solvent flow charts for the basic printing processes and modifications thereof were utilized to indicate the process variables in terms of inputs and outputs. Significant emissions can be expected from web printing (letterpress and lithography using heatset inks), metal decorating, gravure and flexography. Control techniques were reviewed and presented. There are three general approaches to the problem of controlling gaseous emissions from the printing and metal decorating industries: the first, the use of air pollution control equipment, the second, a change of process materials and the third is process modification. All were considered from both a technological and economic review. Changes in process material (e.g., solventless or low-solvent inks) were reviewed. Developments in radiative drying were also discussed. (Author)

PB-195 772
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
ELECTRONIC PRODUCT RADIATION AND THE HEALTH PHYSICIST.

Oct 70, 470p* BRH/DEP-70-26
Presented at the Annual Midyear Health Physics Society Topical Symposium (4th) Louisville, Ky., 28-30 Jan 70.

Descriptors: (*Radiation hazards, Electric equipment), (*Health physics, Radiation hazards), Meetings, Microwaves, X rays, Lasers, Ultraviolet radiation, Radiation effects.

The Fourth Annual Midyear Topical Symposium of the Health Physics Society, cosponsored by the Blue Grass Chapter of the Society and the Bureau of Radiological Health, was held to promote exchanges of information with respect to the status, progress, and future directions in certain areas of radiation exposure. Its subject Electronic Product Radiation and the Health Physicist, encompasses a broad range of sources of exposure. Its scope extends over a large portion of the elec-

tromagnetic spectrum and includes both ionizing and nonionizing radiation. The individual presentations discuss aspects of electronic product radiation ranging from broad surveys and educational needs to specific considerations of instrumentation and biological effects. (Author)

PB-195 805
Office of Business Economics, Washington, D.C. Regional Economics Div.
ECONOMIC PROJECTIONS FOR AIR QUALITY CONTROL REGIONS.
Jun 70, 189p* APTD-0596

Descriptors: (*Air pollution, *Economic projections), Regions, Economic surveys, Economic development, Forecasting, Tables (Data), Industrial wastes, Income, Populations.
Identifiers: Air pollution control, *Air quality Control Regions.

A basis is provided for estimating future pollutant emissions in the 55 Air Quality Control Regions. The nature of projections in general, and the measures used for these projections are first briefly discussed, then the projections themselves are presented. The method of generating the projections is described and the underlying assumptions are specified; a summary in nontechnical language is included as well as a detailed description. (Author)

PB-195 829
Texas Univ., Austin. Dept. of Mechanical Engineering.
USE OF NEW ANALYTICAL METHODS IN WATER RESOURCE DEVELOPMENT.
Water pollution control research series.

Sep 70, 24p* W71-01658, FWQA-16110-FZE-09/70

Descriptors: (*Water resources, *River basin development), Economic analysis, Reservoirs, Dynamic programming, Algorithms, Optimization, Decision theory, Benefit cost analysis, Computer programming.

Studies were made to determine the feasibility of applying recently developed analytical techniques to the problem of planning for optimal water resource development. An optimal plan with regard to the size and location of proposed reservoirs was taken to be that physical configuration which provided the greatest net economic benefit to the people of the region while meeting future water needs. The research was aimed at providing an improvement over planning techniques which have not taken into account the interacting effects which exist between each reservoir and all downstream reservoirs. For the purpose of formulating a mathematical model for this type of problem, a number of recently developed optimization techniques were studied. The intercoupled staging structure of the process was exploited by means of nonserial dynamic programming algorithms developed in the course of the research project. (Author)

PB-195 830
California Univ., Los Angeles. Graduate School of Business Administration.
MATHEMATICAL PROGRAMMING FOR REGIONAL WATER QUALITY MANAGEMENT.
Aug 70, 136p* W71-01659, FWQA-16110-FPX-08/70
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25. I67.13/4:16110FPX08/0.

Descriptors: (*Water quality, Management), (*Water treatment, Mathematical models), Nonlinear programming, Algorithms, Cost analysis, Estuaries, Water treatment, Bypasses, Water pollution.

The application of a non-linear programming algorithm to the problem of optimal water quality control in an estuary is described. A mathematical model gives the solution to the general mixed case of at-source treatment, regional treatment plants, and by-pass piping. The non-linear algorithm is developed in considerable detail and a sample problem is worked out. Detailed results are presented for a pilot problem to illustrate the method of solution. Actual data from the Delaware Estuary is used to solve a large scale problem and the solution is given. (Author)

PB-195 844
Twin Cities Area Metropolitan Transit Commission, St. Paul, Minn.
EVALUATION OF ALTERNATIVE SERVICE IMPROVEMENTS.
Interim rept. no. 6a.
Jul 69, 49p TCAMTC-TD-68-08
Contract DOT-UT-2
Prepared in cooperation with Simpson and Curtin Transportation Engineers, Philadelphia, Pa. See also interim rept. no. 6, PB-195 843. Supported in part by the Department of Housing and Urban Development, Washington, D. C.

Descriptors: (*Passenger transportation, Minnesota), (*Routing, Urban areas), (*Urban transportation, *Minnesota), Revisions, Periodic variations, Scheduling, Cost analysis, Statistical data, Population (Statistics), Bus lines.
Identifiers: *Minneapolis (Minnesota), *Saint Paul (Minnesota), Alternative service.

The document presents detailed descriptions of various route revisions and new route proposals which have been evaluated. The proposals for five routes include no route change, but only suggest the initiation of peak-hour express service. (Author)

PB-195 865
National Center for Air Pollution Control, Cincinnati, Ohio.
STORAGE AND RETRIEVAL OF AIR QUALITY DATA (S A R O A D). SYSTEM DESCRIPTION AND DATA CODING MANUAL.
Environmental health series: air pollution,
Donald H. Fair, George B. Morgan, and Charles E. Zimmer. Jun 68, 54p APTD-68-8

Descriptors: (*Data retrieval, *Air pollution), Data processing, Data storage, Data processing.
Identifiers: SAROAD (Storage and Retrieval of Air Quality Data), Storage and retrieval of air quality data.

The systems for coding sampling site locations, and for coding air quality data for inclusion in the National Center for Air Pollution Control data bank are described. The forms to be used in reporting data are explained. Retrieval programs available for obtaining data summaries are briefly discussed. (Author)

PB-195 888
Pittsburgh Univ., Pa. Graduate School of Public Health.
PATHO-PHYSIOLOGIC RESPONSE TO SINGLE AND MULTIPLE AIR POLLUTANTS IN HUMANS AND ANIMALS.
Final rept. 16 Jan 68-31 May 70,
Morton Corn, Nancy Kotsko, Dolores Stanton, William Bell, and Armand P. Thomas. 1 Jul 70, 136p APTD-0593
Contract PH-86-67-73

Descriptors: (*Respiratory diseases, *Air pollution), (*Sulfur dioxide, Respiratory diseases), (*Public health, Air pollution), Pathophysiology, Cats, Lung, Sodium chloride, Air flow, Nose (Anatomy), Pharynx, Concentration (Composition), Aerosols, Trachea, Respiration.
Identifiers: *Air pollution damage.

Twenty healthy, adult male cats were lightly anesthetized (Nembutal), tracheotomized and were then breathed by a Harvard pump at a fixed frequency and tidal volume. Purified Medical Grade breathing air with or without sulfur dioxide in air or sulfur dioxide in combination with sodium chloride aerosol in air, was delivered to the animals in predetermined exposure sequences and for fixed durations of time. Parameters of response used to judge adaptation of cats to the inhaled challenges of pollutants were pulmonary flow resistance and lung compliance. In addition, pollutant mixtures were delivered to animals via endotracheal catheter and/or face mask to evaluate the possible influence of receptors which may be present in the nasopharyngeal chamber and in the trachea above the tracheal cannula. The major finding was the variability of the responses of the test animals. Certain subjects showed increased pulmonary flow resistance at low SO2 concentration, and were the analogues of the 'reactors' in human populations. Approximately 20 ppm SO2 in air were required to evoke a significant change in pulmonary flow resistance in 'reactors'. The majority of animals showed no response at this concentration of sulfur dioxide in air, either alone or in the presence of NaCl aerosol. When the pollutants were administered via endotracheal catheter and face mask, an increased frequency of significant changes in pulmonary flow resistance in these animals was suggested. All alterations in parameters of response were reversible shortly after exposure ceased. Morphological examination of lung tissue sections after rapid freezing with Freon indicated that measurement of alterations in airway size is not possible in the range of changes of pulmonary flow resistance reported here (< 100%). Methods and data for all experiments are presented in detail.

PB-195 967
Bureau of Radiological Health, Rockville, Md. Div. of Biological Effects.
DOSES TO THE CENTRAL NERVOUS SYSTEM OF CHILDREN RESULTING FROM X-RAY THERAPY FOR TINEA CAPITIS.
Technical rept.,
Wah Lee, and H. D. Youmans. Oct 70, 23p*
BRH/DBE-70-4

Descriptors: (*Radiation dosage, Central nervous system), (*Radiotherapy, Fungus diseases), (*Radiation dosage, Radiotherapy), Dosimetry, X rays, Brain, Eye, Thyroid gland, Exposure, Children.
Identifiers: Tinea capitis.

X-ray beam qualities of 72-118 kVp with HVT's of 0.66-3.9 mm Al were used to irradiate three head phantoms constructed from the skulls of 3-, 6-, and 12-year-old children using Mix D as soft tissue equivalent material. Thermoluminescent dosimeters were used for 'in phantom' exposure measurements. A relatively simple method was developed which yields an accurate estimation of dose distribution in the brain and doses to the eye and thyroid of children (ages 3-12) irradiated with any x-ray technique commonly employed for the treatment of tinea capitis. Typical ranges of doses to the organs of the head are: brain, 100-200 rads; lens of eye, 10-25 rads; and thyroid, 2-5 rads. (Author)

PB-195 968
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
ELECTRONIC PRODUCT INVENTORY STUDY,
Jesse V. Harris. Nov 70, 82p* BRH/DEP-70-29

Descriptors: (*Electric devices, *Radiation hazards), Surveys, Inventories, Market research, Market value, Manufacturers, Ionizing radiation, Radiation, Color television tubes, Xray tubes, Lasers, Microwave equipment.

The report presents the results of a study conducted during 1969 to determine the current and predicted national inventories of electronic products that may emit hazardous radiation. Inventories, production rates, and dollar market values are estimated to provide a general indication of the magnitude of electronic product use. Market data for various types of products which emit ionizing or nonionizing radiation are discussed in detail, growth trends are evaluated, and the future market for these products is estimated. Also included are market data for electronic components and partial listings of electronic product and component manufacturers and associations and groups related to various electronic products. (Author)

PB-195 969
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
PRESENT FEDERAL CONTROL OF HEALTH HAZARDS FROM ELECTRONIC PRODUCT RADIATION AND OTHER TYPES OF IONIZING RADIATION (AS OF NOVEMBER 1969).
Nov 70, 217p* BRH/DEP-70-28

Descriptors: (*Health physics, Ionizing radiation), (*Radiation hazards, Control), (*Electronics, Radiation hazards), Radiation effects, Public health, Materials, Projects, Radioactive materials, Government policies.

This report documents the results of a survey which was performed during the period from June to October 1969 to investigate the various facets of Federal radiation control. The items investigated included statutory control authority, control programs and procedures, and the quantities and various types of radiation-emitting electronic products and radioactive materials used by the Federal government. Thirty-three selected departments and agencies were asked to answer specific questions relating to their programs for controlling radiation from electronic products and radioactive materials. Their responses are summarized and discussed. (Author)

PB-195 970
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
THE USE OF RADIOACTIVE MATERIALS IN GAS CHROMATOGRAPHY,
George L. Pettigrew, and Jerome A. Halperin. Oct 70, 19p* BRH/DMRE-70-5

Descriptors: (*Gas chromatography, Radioactive materials), (*Radioactive materials, *Radiation hazards), Radiation counters, Ionization chambers, Electron capture, Safety.

It is the purpose of the report to familiarize the reader with: operating principles of gas chromatography, the hazards from radioactive materials used in chromatographs, and safety precautions which could minimize the hazards. It is hoped that such an approach will result in a safer utilization of this radiation source. (Author)

PB-195 971
Bureau of Radiological Health, Rockville, Md. Office of the Director.
PUBLICATIONS INDEX, JULY 1970.
Nov 70, 228p BRH/OBD-70-1

Descriptors: (Radiation hazards, Bibliographies), (*Radiobiology, Indexes (Documentation)), Health physics, Public health, Radiation hazards, Information retrieval, Bibliographies, Index terms, Data processing, Documents.

This Key Word in Context (KWIC) index to the publications of the Bureau of Radiological Health was prepared to aid in the retrieval and identification of publications originated or authored by Bureau staff. These publications include journal articles, government publications and technical reports, press releases, and selected staff papers. For convenience, the document is divided into three sections, KWIC Index, Author Index, and Bibliography Index.

PB-195 972
Bureau of Radiological Health, Rockville, Md. Office of the Director.
1969 ANNUAL REPORT TO THE CONGRESS ON THE ADMINISTRATION OF THE RADIATION CONTROL FOR HEALTH AND SAFETY ACT OF 1968 PUBLIC LAW 90-602.
1 Apr 70, 97p* BRH-OBD-70-3
Also includes Report on Studies Conducted Pursuant to Section 357, Public Law 90-602.

Descriptors: (*Health physics, Public law), (*Radiation hazards, Control), Public health, Safety, Radiation effects, Radiobiology, Standards, Ionizing radiation, Electronics, Safety, Electric equipment, Law enforcement, Ultraviolet radiation, Microwaves, Lasers, Management.

Contents: Appraisal of incidence of biological injury and effects; List of radiation control standards; Evaluation of observance of applicable standards; Summary of outstanding problems; Analysis and evaluation of research activities and technological progress; Completed or pending judicial actions; Dissemination of technical and consumer-oriented information; Cooperation between government and industry and other interested parties; Report to the Congress on studies conducted pursuant to Section 357 of the Radiation Control for Health and Safety Act of 1968; List of Bureau of Radiological Health detailed study reports prepared pursuant to Section 357, Public Law 90-602.

PB-196 003
Stanford Research Inst., Menlo Park, Calif.
A PRACTICAL, MULTIPURPOSE URBAN DIFFUSION MODEL FOR CARBON MONOXIDE.
Final rept.,
F. L. Ludwig, Albert E. Moon, Warren B. Johnson, and Robert L. Mancuso. Sep 70, 184p* APTD-0604
Contract PHS-CPA-22-69-64

Descriptors: (*Urban areas, *Air pollution), (*Carbon monoxide, *Atmospheric motion), (*Exhaust gases, Atmospheric motion), Atmospheric diffusion, Meteorological data, Mathematical models, Periodic variations, Seasonal variations, Vehicular traffic, Mixing, Wind (Meteorology), Urban planning, Concentration (Composition).

The development and current status are described of a receptor-oriented diffusion model that can be applied to urban areas to give the following outputs: Carbon monoxide (CO) concentration isopleths for a given set of meteorological conditions and times of day. Sequences of hourly CO concentrations at specific locations for given sequences of meteorological conditions, climatological summaries of CO concentration for specific locations if an historical record of meteorological data is available. The model can be used to obtain the frequency distributions of concentrations averaged over various time intervals for specific hours of the day or days of the week. Model inputs are traffic volumes on major streets and highways in the urban area, atmospheric stability, mixing depth, and wind speed and direction. The concentrations calculated with the model are compared with observations of CO concentration from Continuous Air Monitoring Program (CAMP) stations. Although the agreement is not good--the model generally calculates concentrations lower than those observed--improvement is obtained by empirical corrections. Possible reasons are given for the disagreement between calculations and observations, and a field measurement program is described that the authors feel will help to define the sources of the discrepancies and provide the information necessary for their correction. (Author)

PB-196 028
Industrial Gas Cleaning Inst., Inc., Rye, N.Y.
MANUFACTURERS' REPORT OF AIR POLLUTION CONTROL EQUIPMENT SALES FOR THE YEARS 1966, 1967, AND 1968.
1970, 9p APTD-0603
Contract PHS-CPA-22-69-5, PHS-CPA-70-18

Descriptors: (*Air pollution control equipment, *Sales), (*Particles, Air pollution control equipment), Tables (Data), Electrostatic precipitators, Gas filters, Scrubbers, Absorbers (Equipment), Oxidation, Consumers, Metal industry, Glass industry, Food industry, Textile industry, Paper industry, Chemical industry, Petroleum industry, Rubber industry, Plastics industry.

Tables alone are presented of the number and dollar amount of sales for 1966, 1967, and 1968 for each of four types of particulate control equipment (electrostatic, mechanical, fabric filter, and wet scrubber) and four types of gaseous control equipment (absorber, thermal oxidation, direct combustion, and catalytic oxidation). The tables are further sub-divided by the standard industrial classification of the buyers. (Author)

PB-196 110
Halliburton Co., Duncan, Okla.
INVESTIGATIVE MINE SURVEY OF A SMALL WATERSHED.
Mar 70, 97p W71-02275, FWQA-14010-DMO-03/70-A
Contract FWPCA-14-12-453
Report on A Field Investigation to Locate and Define Unknown or Hidden Drift Mine Openings in the Browns Creek Watershed of the West Fork River in West Virginia. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402, $2.00 as I67.13/4:14010-DMO-03/70-A.

Descriptors: (*Watersheds, *West Virginia), (*Coal mines, *Drainage), (*Water pollution, *Mine waters), Openings, Land surveys, Mine surveys, Strip mining, Augers, Probes, Abatement, Maps.
Identifiers: Harrison County (West Virgisia), Browns Creek watershed, *Mine acid drainage, *Water pollution control.

The primary purpose of this project was to conduct an investigation to locate hidden or unknown drift mine openings in the Browns Creek Watershed in Harrison County, West Virginia. Thirty unknown openings were discovered in an initial reconnaissance. Additional probing using power driven augers was not successful and was deemed impractical. Three specific areas within the watershed were selected for further scrutiny. The bottom of the highwall line in the strip mined area was determined by land surveyors and this information was plotted on old mine maps to indicate the intersection of the stripping with underground mining. A minimum of 107 mine drifts were shown to be exposed by the 14,500 feet of highwall surveyed in the three areas. (wrsic abstract).

PB-196 111
National Association of Counties Research Foundation, Washington, D.C.
URBAN SOIL EROSION AND SEDIMENT CONTROL.
Water pollution control research series,
Mel D. Powell, William C. Winter, and William P. Bodwitch. May 70, 113p W71-02276,
FWQA-15030-DTL-05/70
Grant FWQA-15030-DTL
Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $1.00 as I67.13/4: 15030-DIL-05/70

Descriptors: (*Soil erosion, *Urban areas), (*Sedimentation, Control), Watersheds, Management planning, Water pollution, Water law, Water resources, Surface water runoff, Reviews.

The study was conducted to determine the causes and the extent of urban and suburban soil erosion and sediment problems, and to describe ways in which local communities can organize and implement effective sedimentation control programs. An evaluation is provided on the state-of-the-art of urban sedimentation control, and a series of research needs in the sedimentation field is cited. In addition, this report includes the 'Community Action Guidebook for Soil Erosion and Sediment Control' which describes methods by which local governments can organize, plan, finance, staff, and implement urban sedimentation control programs. Aspects of areawide approaches, legal authority, and public support for sedimentation control are discussed, and an action plan is outlined. It was found that soil erosion and sediment in developing areas is extensive, and that these problems pose significant threats to both soil and water resources. While many of the required technical means for controlling sedimentation problems already exist, new administrative approaches are needed which accommodate the diversity of interests and pressures associated with urban and suburban development. (WRSIC Abstract).

PB-196 112
Robert S. Kerr Water Research Center, Ada, Okla.
NUTRIENT REMOVAL FROM ENRICHED WASTE EFFLUENT BY THE HYDROPONIC CULTURE OF COOL SEASON GRASSES.
Water pollution control research series,
James P. Law, Jr. Oct 69, 45p W71-02277, FWQA-16080-10/69
Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $0.50 as I67.12/4: 16080-10/69.

Descriptors: (*Waste water, Nutrients), (*Grasses, Hydroponics), (*Nutrients, Removal), Statistical analysis. Rye plants, Turf grasses, Nitrogen organic compounds, Phosphorous, Oxygen, Sewage.

Grasses were grown in hydroponic culture tanks to evaluate their nutrient removal capabilities when supplied with secondary-treated sewage effluent as the sole source of plant nutrients. Statistical methods were employed to determine the effects of the grasses, flow rates, and seasons on nutrient removal. Two control tanks with gravel bed and no grass were maintained throughout the study, two were planted with tall (Ky 31) fescue, and two were planted with perennial ryegrass. Two flow rates were maintained in each pair of tanks, approximately one-day and two-day detention times. All six tanks were effective in reducing the oxygen-demanding organic content of the effluent. Total nitrogen content was reduced appreciably by the control tanks, but the grass tanks were significantly better at nitrogen removal. Total phosphorus concentrations were reduced only slightly by passage through the tanks. The fast flow rate tanks produced the greater grass yields, while the slow flow rate tanks were more effective in nutrient removal from the sewage effluent. From grass yield and analyses data, the amount of plant nutrient material removed by the grasses was small compared to the total quantity supplied. (Author)

PB-196 113
Mellon Inst., Pittsburgh, Pa.
MICROBIOLOGICAL FACTOR IN ACID MINE DRAINAGE FORMATION. II. FURTHER OBSERVATIONS FROM A PILOT PLANT STUDY.
Water pollution control research series,
Robert A. Baker, and Albert G. Wilshire. Jul 70, 81p W71-02278, FWQA-14010-DKN-11/70
Grant FWQA-14010-DKN
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.70 as I67.13/4:14010-DKN-11/70.

Descriptors: (*Pyrite, *Biodeterioration), (*Microbiology, Coal mines), (*Water pollution, *Mine waters), (*Coal mining, Water pollution), Industrial wastes, Waste water, Acidity, Bacteria, Ferrobacillus, Thiobacillus, Iron, Sulfates, Iron sulfides, Aerobic bacteria, Algae, Growth, Aerobic processes, Metabolism, Flow rate, Aeration.
Identifiers: *Chemoautrophic microorganisms, *Mine acid drainage.

The role of chemoautrophic organisms in the formation of acid mine drainage from pyritic materials associated with coal mining has been investigated by pilot plant techniques. Dynamic flow, controlled environment units which served as models of mines were used. It was demonstrated that the concentration of acidity, ferrous and total iron and sulfate in the effluent from aerobic, biologically-seeded or unseeded pyritic beds is zero order with respect to flow, except at low flow rates where mass transport is diffusion limited. Algal growth occurred in the acidic, aerobic environment but did not affect acid production. Nonaerobic systems produce acidity consisting only of ferrous iron. Total acidity is lower from biologically-seeded than -nonseeded aerobic systems. Acid mine drainage was not significantly affected by seeding with the individual or a mixture of three different organisms but was increased by recycle of the flow and increased appreciably under forced aeration. The rate is directly related to the available pyrite surface area. (WRSIC abstract)

PB-196 148
University of Southern California, Los Angeles. Dept. of Civil Engineering.
SPECIAL STUDIES OF A SANITARY LANDFILL.
Final summary rept. 1 Jan 64-31 Dec 68 and progress rept. no. 3, 1 Jan 68-31 Dec 68,
Robert C. Merz, and Ralph Stone. 1970, 240p*
EPA-SW-8RG-70
Grant PHS-UI-00518-08
Continuation of Grants PHS-EF-00160-04, PHS-EF-00160-05, PHS-SW-00028-06, and PHS-UI-00518-07.

Descriptors: (*Earth fills, *Refuse disposal), (*Garbage disposal, Earth fills), (*Sanitary engineering, Earth fills), Waste disposal, Aeration, Percolation, Anaerobic conditions, Aerobic processes, Gases, Compacting, Field tests, Rainfall intensity, Climate, Settling.
Identifiers: *Sanitary landfills, *Solid waste disposal.

Model sanitary landfill cells were constructed and, over a 4+ year period, subjected to simulated environmental conditions such as added water, aeration, and aerobic and anaerobic operation. The effect of these conditions on percolation, gas quality and production, settlement, and temperature was measured. Examination of core samples taken at the end of the study period showed that refuse in the aerated cell was well decomposed except for plastics and other inerts and that refuse in the anaerobic cells was easily identifiable. Based on an original cell depth of 20 feet, volume reduction in the aerated cell was 21.5% and in the anaerobic cells, 11.5%. The four parts of the report detail the activity during the last year of the project and summarize the data collected for the span of the project 1964-1968. (Author)

PB-196 162
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
CYCLOTRON PRODUCTION OF 123I- AN EVALUATION OF THE NUCLEAR REACTIONS WHICH PRODUCE THIS ISOTOPE,
Vincent J. Sodd, Kenneth L. Scholz, James W. Blue, and Henry N. Wellman. Oct 70, 49p
BRH/DMRE-70-4
Prepared in cooperation with National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.

Descriptors: (*Iodine isotopes, Production methods), Radiation dosage, Nuclear reactions, Dose rate, Drugs, Spectrum analysis, Cyclotrons.
Identifiers: *Iodine 123, Radio medicine.

The document was prepared by the Nuclear Medicine Laboratory of the Division of Medical Radiation Exposure. The purpose of this research was to establish and describe the use of the various nuclear reactions by which 123I, a superior, low-radiation dose radiopharmaceutical, can be cyclotron-produced. Herein are reported both the methods of directly producing 123I and those which indirectly produce the radionuclide through the positive beta decay of its natural precursor, 123Xe. It is impossible to separate 123I from the troublesome radioiodine contaminants, notably 124I, which occur in the direct method. Thus, it is much preferable to produce pure 123I from 123Xe, which is easily separated from the radioiodines. It is hoped that the findings of this research will stimulate the use of 123I. Among its desirable characteristics is the capability of reducing the patient dose in a thyroid uptake measurement to a very small percentage of that delivered by the more commonly used 131I. Since 131I has been found responsible for most of the absorbed tissue dose in nuclear medicine, general adoption of pure 123I could have far-reaching effects in reducing the medical radiation dose to the pulation. (Author)

PB-196 174
National Air Pollution Control Administration, Arlington, Va.
AIR POLLUTION TRANSLATIONS: A BIBLIOGRAPHY WITH ABSTRACTS. VOLUME 2.

Apr 70, 115p* NAPCA-Pub-AP-69
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.00 as HE20.1309.69. See also Volume 1, PB-190 258.

Descriptors: (*Air pollution, *Bibliographies), Translations, Abstracts, Sources, Meteorology, Corrosion, Law (Jurisprudence), Standards, Plants (Botany), Humans.
Identifiers: *Air pollution detection, *Air pollution control, *Air pollution damage, *Plant damage.

Abstracts of 444 translations are presented within 12 subject categories. About 95% of the translations were requested by the staff of the National Air Pollution Control Administration and provided by the Air Pollution Technical Information Center (APTIC). For almost half of the documents, the original language was German. Fourteen other languages are represented. Three indexes are included: author; language; and subject. (Author)

PB-196 304
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
NATIONWIDE INVENTORY OF AIR POLLUTANT EMISSIONS-1968.

Aug 70, 44p* NAPCA-Pub-AP-73
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.30 as HE20.1309:73.

Descriptors: (*Air pollution, *United States), (*Carbon monoxide, Air pollution), (*Sulfur oxides, Air pollution), (*Nitrogen oxides, Air pollution), (*Particles, Air pollution), (*Hydrocarbons, Air pollution), Surveys, Inventories, Forecasting, Urban areas, Evaporation, Fuels, Exhaust gases, Combustion products, Refuse disposal, Forest fires, Estimates, Incinerators, Transportation, Industrial wastes.
Identifiers: *Air pollution forecasts.

Estimates are presented of the five primary air pollutants; carbon monoxide (CO), sulfur oxides (SOx), particulates, hydrocarbons (HC), and nitrogen oxides (NOx). Emission trends from 1966

through 1968 are included as well as motor vehicle emissions projected to 1990. Information is presented on nationwide emissions given by source category and location (urban and non-urban). Presented also are the methodology and basic data used to make the emission estimates, such as fuel usage, vehicle miles of travel, and solid waste disposal methods. (Author)

PB-196 379
Southern Research Inst., Birmingham, Ala.
SELECTED BIBLIOGRAPHY OF ELECTROSTATIC PRECIPITATOR LITERATURE.

Mar 70, 161p* APTD-0612
Contract PHS-CPA-22-69-73

Descriptors: (*Electrostatic precipitators, *Bibliographies), (*Air pollution control equipment, Bibliographies), Indexes (Documentation).

The bibliography is arranged alphabetically by author and numbered sequentially. In the back of the bibliography, about 100 descriptors comprising the thesaurus are listed with numbers corresponding to the articles for which the particular descriptor is appropriate. There are 1017 articles entered. (Author)

PB-196 380
Southern Research Inst., Birmingham, Ala.
A MANUAL OF ELECTROSTATIC PRECIPITATOR TECHNOLOGY. PART I - FUNDAMENTALS,
Sabert Oglesby, Jr., and Grady B. Nichols. 25 Aug 70, 338p* 10000-2291-13-Pt-1 APTD-0610
Contract PHS-CPA-22-69-73
See also Part 2, PB-196 381.

Descriptors: (*Electrostatic precipitators, *Reviews), (*Air pollution control equipment, Electrostatic precipitators), (*Handbooks, Electrostatic precipitators), Design criteria, Gas flow, Electric corona, Electric charge, Maintenance, Manuals, Charged particles, Electrical resistivity, Entrainment, Fly ash, Particles, Dust, Aerosols, Sulfur dioxide.

The state of technology of electrostatic precipitation for particulate emission control is reported. The report is intended to serve as a basic handbook on the subject of electrostatic precipitation covering the entire system including fundamental theory, design, operation, and application. Its purpose is to provide a source of information that will be of benefit to the researcher, manufacturer, and user of electrostatic precipitators. The systems study included a review of literature pertaining to electrostatic precipitation, a comprehensive review of precipitator fundamentals, a survey and review of the use of precipitators in each of eight major application areas, and a review of the potential for electrostatic precipitators in new applications. In order to provide information useful to a wide range of users, this manual is organized to present a general review of the precipitation process, with qualitative relationships between the various precipitator functions, and a detailed quantitative analysis of each of the system functions. Particular emphasis is placed on the validity of the theoretical derivations in view of the assumptions made and the significance of the interaction of variables of importance in precipitator operation. Further discussions include mechanical design considerations, energization equipment, gas flow, operational problems, and the current utilization of precipitators in the major application areas. (Author)

PB-196 381
Southern Research Inst., Birmingham, Ala.
A MANUAL OF ELECTROSTATIC PRECIPITATOR TECHNOLOGY. PART II - APPLICATION AREAS,
Sabert Oglesby, Jr., and Grady B. Nichols. 25 Aug 70, 584p* 10000-2291-13-Pt-2 APTD-0611
Contract PHS-CPA-22-69-73
See also Part 1, PB-196 380.

Descriptors: (*Electrostatic precipitators, *Reviews), (*Air pollution control equipment, Electrostatic precipitators), (*Handbooks, Electrostatic precipitators), Manuals, Steam electric power generation, Sulfate pulping, Paper industry, Steel making, Metal industry, Cement industry, Chemical industry, Incinerators, Petroleum refining, Dust, Aerosols, Sulfur dioxide, Fly ash, Iron and steel industry, Sulfuric acid, Phosphoric acid, Air filters, Efficiency, Cost estimates.

The report presents information based on records covering electrostatic precipitator installations in the various application areas. To supplement this data a number of installations in various industries were surveyed. In some instances, considerable data were available covering both design and performance of the precipitators. In other instances, data were not available. Consequently, the extent and quality of the information covering the application areas varies. Chapters are included on: electric power generation; pulp and paper; iron and steel industry; rock products; chemical industry; municipal incinerators; petroleum industry; nonferrous metals; high temperature, high pressure gas cleaning; and new application areas.

PB-196 410
National Air Pollution Control Administration, Raleigh, N.C.
AIR POLLUTION CONTROL ACTIVE RESEARCH GRANTS FOR FISCAL YEAR 1970.
Sep 70, 58p* APTD-0582
See also Report dated Oct 69, PB-194 806.

Descriptors: (*Air pollution, *Research projects), Grants, Expenses, Public health, Respiratory diseases, Atmospheric corrosion, Chemical analysis, Exhaust gases, Combustion products, Plants (Botany), Economic analysis, Atmospheric motion, Condensation nuclei.
Identifiers: *Air pollution control, Plant damage, Air pollution damage.

Research grants were awarded in eight major areas: human health effects, agricultural effects, socio-economic and political studies, physico-chemical investigations, development of analytic methods and equipment meteorology, air pollution source control, and communications. A table summarizes the quantity and amount of the grants in each categorical area. Another table shows the distribution of the quantity, amount, and percent of total funds by subject area within each category. In the main listing, for each subject area within each category, the following are listed: each grant number; the grantee's name, institution, and project title; project period; and monetery support. A numerical index of grant numbers refers the reader to the page where each is listed. (Author)

PB-196 440
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
INEXPENSIVE READOUT FOR A COMMERCIAL THERMOCOUPLE MICROWAVE POWER DENSITY PROBE,
Robert L. Cloke. Dec 70, 21p BRH/DEP-70-31

Descriptors: (*Radiometers, Microwave equipment), Thermocouples, Flux density, Design, Measuring instruments, Microwaves.

The paper describes an inexpensive, easy-to-build readout circuit which can be used with the Narda 8122 thermocouple microwave power density probe. The instrument is capable of reading full-scale power densities of 10 mW/sq cm and 100 mW/sq cm at frequencies of 915 MHz and 2450 MHz, and includes all of the necessary features of the Narda 8100 system. (Author)

PB-196 441
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
A TRAINING MANUAL FOR NUCLEAR MEDICINE TECHNOLOGISTS.
Technical rept.,
Guy H. Simmons, and George W. Alexander. Oct 70, 225p BRH/DMRE-70-3
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.75 as HE20.1508:N88.

Descriptors: (*Radiobiology, Manuals), (*Medical personnel, Nuclear radiation), (*Medicine, *Nuclear radiation), Training, Education, Radioactivity, Radiation measuring instruments, In vivo analysis, In vitro analysis, Radiotherapy, Radiation dosage, Diagnostic agents, Isotopic labeling, Dosimetry.
Identifiers: *Nuclear medicine, Medical technologists, *Nuclear medical technologists.

The manual was prepared for the training program in Nuclear Medicine Technology at the University of Cincinnati. The program in which this manual is used leads to the Bachelor of Science degree in Medical Technology with a Nuclear Medicine option. This manual is used in teaching nuclear physics and instrumentation, radionuclide measurements, radiation protection, and tracer methodology and radiopharmaceuticals. It is offered as an addition to the exiguous literature presently available to those who wish to train Nuclear Medical Technologists. Since college level courses in anatomy and physiology, chemistry, physics, and basic mathematics are prerequisite to the internship in which this manual is used, the fundamentals of these sciences are not included except for the mathematics review in the appendix.

PB-196 443
Bureau of Radiological Health, Rockville, Md. Office of the Director.
UNIVERSITY CURRICULUMS AND FELLOWSHIPS IN RADIOLOGICAL HEALTH.

1970, 88p* BRH/OBD-70-2

Descriptors: (*Radiobiology, Education), Universities, Grants, Financing, Public health, Technical schools.

The Radiological Health Training Grants Program funds are used to strengthen and extend programs of basic instruction, to add to the faculty and its supporting staff, to secure equipment, and to encourage greater enrollment by providing financial assistance to qualified students preparing for careers in radiological health. The supported projects operate at two academic levels, Radiological Health Specialists (graduate) and Radiological Health Technicians (undergraduate). This booklet has been prepared to describe the academic programs funded through these grants. This information should be of assistance to educational institutions considering the development of programs in this area and to students considering educational opportunities. (Author)

PB-196 448
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
A STUDY TO DETERMINE THE NECESSITY FOR THE DEVELOPMENT OF STANDARDS FOR THE USE OF SELECTED NONMEDICAL ELECTRONIC PRODUCTS FOR COMMERCIAL AND INDUSTRIAL PURPOSES,
Walter E. Gundaker, Thomas M. Moore, and Steven A. Coppola. Dec 70, 119p* BRH/DEP-70-30

Descriptors: (*Radiography, Safety), (*Particle accelerators, Safety), (*X ray apparatus, Safety), (*Safety, Electric equipment), Standards, Radiation hazards, Fluoroscopes.

The report presents the findings of a study conducted during 1969 to determine the need for developing standards for the use of selected non-

medical electronic products for commercial and industrial purposes. Three classes of products were investigated: industrial radiographic and fluoroscopic x-ray units, particle accelerators, and analytical x-ray equipment. For each category the equipment, its typical uses, and the attendant radiation hazards are described, and radiation safety measures are discussed. Existing guidelines and controls for each class of equipment are presented, and incidents involving radiation exposure are reviewed. The need for standards for the use of the equipment is also discussed. (Author)

PB-196 499
TRW Systems Group, Redondo Beach, Calif.
HOLOGRAPHIC DETERMINATION OF INJECTED LIMESTONE DISTRIBUTION IN UNIT 10 OF THE SHAWNEE POWER PLANT.
Final rept.,
B. J. Matthews, and R. F. Kemp. Jun 70, 89p*
14103-6001-RO-00 APTD-0594
Contract PHS-CPA-70-4

Descriptors: (*Air pollution, *Sulfur dioxide), (*Limestone, *Adsorbents), (*Holography, *Flow distribution), Evaluation, Injection, Furnaces, Thermal power plants, Ruby lasers, Penetration, Distribution (Property), Field tests, Resolution, Boilers, Combustion products, Aerosols, Light scattering.
Identifiers: *Shawnee power plant.

Pulsed ruby laser holography was applied as a technique for detecting the penetration and dispersion of limestone plumes injected into the Unit 10 boiler operating at nominal conditions. The experimental equipment, the laboratory experiments, and the test programs are described. Two-beam scattered light holography of particulate in an operating boiler (nominal power output of 140 mw) is entirely feasible. Photometric means of evaluating the reconstructed holographic images have been developed to the extent that quantitative data, as well as qualitative impressions can be obtained. (Author)

PB-196 500
National Air Pollution Control Administration, Raleigh, N.C.
ECONOMIC IMPACT OF AIR POLLUTION CONTROLS ON GRAY IRON FOUNDRY INDUSTRY.

Nov 70, 117p* NAPCA-Pub-AP-74
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.65 as FS2.300:AP.74.

Descriptors: (*Air pollution, *Economic surveys), (*Foundries, Air pollution), (*Iron and steel industry, Air pollution), (*Air pollution control equipment, Foundries), (*Particles, Air pollution), Gray iron, Abatement, Economic analysis, Dust, Industrial wastes, Cyclone separators, Scrubbers, Gas filters, Expenses, Cost estimates, Profits, Environmental surveys, Melting, Abatement.
Identifiers: *Air pollution control.

The purpose of the study was to identify the costs and to assess the economic impact of controlling air pollution from gray iron foundries. Two principal considerations commend the gray iron foundry industry to this type of study. First, the industry is an important source of particulate pollution in most urban metropolitan areas (170,000 tons in 1968). Second, the industry includes a large number of small establishments that may find it difficult to finance the purchase and operation of pollution control equipment. Approximately a third of all companies in this industry employ less than 20 employees. Pollution control costs are examined for the various types of systems commonly applied to reduce furnace emissions. Factors that may influence control costs are tested between the different types of control systems and within types of a systems. Costs of control are measured against the economic strength of the industry and against the financial condition of firms in the industry. Two types of data were collected, individual company data and aggregated industry data. All the known producers of gray iron were surveyed by mail in 1968 to determine which ones had installed pollution control equipment, the types of equipment, and the costs.

PB-196 631
McNally Pittsburg Mfg. Corp., Kans.
A STUDY ON DESIGN AND COST ANALYSIS OF A PROTOTYPE COAL CLEANING PLANT. PART 1-6.
Proposal no. 62521.

Nov 69, 193p* APTD-0606
Contract PH-22-68-59
See also Part 7, PB-196 632.

Descriptors: (*Coal, *Desulfurization), (*Coal preparation, *Cost engineering), (*Beneficiation, Coal preparation), Air pollution, Abatement, Sulfur compounds, Contaminants, Sulfur dioxide, Combustion products, Pilot plants, Economic analysis, Concentration (Composition).
Identifiers: *Air pollution control.

The report presents the results of research in which the following points were to be investigated: To study approximately 200 sets of coal washability data from which to evaluate and classify coal suitable for producing a clean coal with different sulfur content; To develop a scheme of ranking for these coals; To develop a design for the most appropriate, conventional type coal cleaning plant to remove sulfur compounds; To develop the installed cost of the plant, and estimated costs for the operation of the plant; To develop test schedules for the evaluation of each coal to be processed in the plant; And finally to estimate costs for the analysis of data to be generated in the prototype plant and develop flowsheets for full scale plants for the coals washed in the prototype plant. (Author)

PB-196 632
McNally Pittsburg Mfg. Corp., Kans.
COAL CLEANING PLANT PROTOTYPE PLANT SPECIFICATIONS. PART 7.
Proposal no. 62521.

Nov 69, 127p* APTD-0607
Contract PH-22-68-59
See also Part 8, PB-196 633.

Descriptors: (*Coal, *Desulfurization), (*Equipment specifications, *Coal preparation), (*Beneficiation, Coal preparation), Prototypes, Pilot plants, Air pollution, Abatement.
Identifiers: *Air pollution control.

The specifications include: plant facility; sampling and testing; index of equipment; general mechanical specifications; and description of equipment (182 units). (Author)

PB-196 633
McNally Pittsburg Mfg. Corp., Kans.
COAL CLEANING PLANT PROTOTYPE PLANT DESIGN DRAWINGS. PART 8.
Proposal no. 62521.

Nov 69, 40p* APTD-0608
Contract PH-22-68-59
See also PB-196 634.

Descriptors: (*Coal, *Desulfurization), (*Engineering drawings, *Coal preparation), (*Beneficiation, Coal preparation), Prototypes, Pilot plants, Air pollution, Abatement.
Identifiers: *Air pollution control.

Eighteen drawings including a flow diagram, plans, elevations, sections, and a general plot plan are presented for a prototype coal cleaning plant. (Author)

PB-196 634
McNally Pittsburg Mfg. Corp., Kans.
A STUDY ON DESIGN AND COST ANALYSIS OF A PROTOTYPE COAL CLEANING PLANT. SUPPLEMENT.

Nov 69, 14p* APTD-0609
Contract PH-22-68-59
See also PB-196 631.

Descriptors: (*Coal, *Desulfurization), (*Beneficiation, Coal preparation), (*Cost engineering, *Coal preparation), Cost estimates, Reduction (Chemistry), Government furnished equipment, Test facilities, Air pollution, Abatement, Sulfur compounds, Concentration (Composition).
Identifiers: *Air pollution control.

Four alternate methods suggested in the report which this one supplements are explained in detail. The most economical method to determine the reduction of sulfur from a given raw coal is based on beneficiation equipment currently used by coal washing contractors; it involves extensive laboratory testing from suitable raw coal samples. If carried out in one of the existing government laboratories it would involve no capital investment; operating costs would also be small. In case a plant is desired to demonstrate in actual practice the reduction of sulfur as well as to generate data for a given coal, it will be of substantial value both from a scientific and commercial standpoint to build a full scale commercial plant. Being capable of operation at a full commercial rate, this facility would be able to provide an adequate return on the total investment. It would be an added advantage if cooperation could be obtained from a large coal company to run the plant. (Author)

PB-196 733
FMC Corp., Santa Clara, Calif. Central Engineering Labs.
DEVELOPMENT OF A PILOT PLANT TO DEMONSTRATE REMOVAL OF CARBONACEOUS, NITROGENOUS AND PHOSPHORUS MATERIALS FROM ANAEROBIC DIGESTER SUPERNATANT AND RELATED PROCESS STREAMS.
George E. Bennett. May 70, 82p* W71-03453, FWQA-17070-FKA-05/70
Grant FWQA-14-12-414
Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402, as I67.13/4:17010 FKA-05/70. $1.00.

Descriptors: (*Water pollution, Phosphates), (*Sewage treatment, *Phosphates), (*Nitrogen inorganic compounds, Sewage treatment), (*Packaged sewage plants, Mobile equipment), Pilot plants, Digesters, Nutrients, Chemical removal (Sewage treatment), Calcium oxides, Precipitation (Chemistry), Ammonia, Cost estimates.
Identifiers: Secondary sewage treatment.

Digester supernatant contains high concentrations of nitrogen and phosphorus. Also, poor quality supernatant discharged from an anaerobic digester can have an adverse effect on the overall efficiency of a wastewater treatment plant. The report discusses the building and demonstrating of a unique, trailer-mounted, and completely self-contained pilot plant. The pilot plant is designed to investigate the improvement of digester supernatant quality, with particular emphasis on the removal of nitrogen and phosphorus. The pilot plant treatment sequence consists of carbon dioxide removal via air-stripping, lime precipitation of phosphorus and carbonaceous particulate matter, and removal of nitrogen by packed-tower ammonia-stripping. The pilot plant was operated over a two-month period at a trickling filter plant where two-stage anaerobic digestion is practiced. It was found that 80-95% of supernatant phosphorus could be removed at a lime dosage equal to 50 pounds of hydrated lime per pound of phosphorus removed. Average ammonia-nitrogen removal was 82%, achieved at an air flow rate equal to 83,000 cubic feet of air per pound of NH3-N removed. Normal

lime precipitation removed about one-half of the supernatant TOC, COD, AND Organic Nitrogen. The average decrease in ruspended solids was 64%. (Author)

PB-196 734
Johns-Manville Research and Engineering Center, Manville, N. J.
PHOSPHORUS REMOVAL USING CHEMICAL COAGULATION AND A CONTINUOUS COUNTERCURRENT FILTRATION PROCESS.
Water pollution control research series,
G. R. Bell, D. V. Libby, and D. T. Lordi. Jun 70, 63p* W71-03454, FWQA-17010-EDO-06/70
Contract FWCA-14-12-154

Descriptors: (*Water pollution, Phosphates), (*Sewage treatment, *Phosphates), (*Precipitation (Chemistry), *Phosphorus inorganic acids), (*Sewage filtration, Sewage treatment), (*Alums, Sewage treatment), (*Coagulation, Sewage treatment), Cost estimates, Anion exchanging, Polyelectrolytes, Trickling filtration, Clarification, Biochemical oxygen demand, Pilot plants, Flocculation, Nutrients, Chemical removal (Sewage treatment).
Identifiers: Secondary sewage treatment.

A continuous precipitation and countercurrent filtration process was evaluated for the removal of phosphorus from municipal wastewater. Using alum and an anionic polyelectrolyte, the process was found to effectively reduce total phosphorus (TP), orthophosphate (OP) and condensed phosphate (CP) over a wide range of influent phosphorus concentrations. Preliminary work using jar tests established an alum dose of 200 mg/l (17.4 mg/l Al, molar ratio of Al1P is 27/31) as effective for removal of 90 per cent TP from the secondary clarifier effluent of a trickling filter plant. This removal efficiency could not be sustained with an alum dose of 200 mg/l when higher TP levels were encountered. Substantial reductions in final effluent total suspended solids (TSS) and 5-day biochemical oxygen demand (BOD5) were also obtained. The 200 mg/l alum dose was also found to be equally effective for removal of phosphorus from raw sewage and primary effluent with the added capability for removing substantial portions of the TSS and BOD5. Costs for a 1.0 MGD plant are estimated to be $264,000 for capital and 12.0 cents per 1000 gal for total operating cost. Ultimate disposal of the phosphorus-containing sludge could be achieved by a dewatering and landfill operation. (Author)

PB-196 735
Tyco Labs., Inc., Waltham, Mass.
BASIC SALINOGEN ION-EXCHANGE RESINS FOR SELECTIVE NITRATE REMOVAL FROM POTABLE AND EFFLUENT WATERS.
Water pollution control research series,
A. L. Walitt, and H. L. Jones. Dec 69, 95p W71-03459, FWQA-17010-FKF-12/69
Contract FWQA-14-12-439
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.00 as I67.13/4:17010-FKF12/69.

Descriptors: (*Water pollution, Nitrates), (*Ion exchanging, *Nitrates), (*Sewage treatment, Nitrates), (*Water treatment, Nitrates), (*Ion exchange resins, Synthesis (Chemistry)), (*Chemical removal (Water treatment), Nitrates), Polystyrene, Potable water, Amines, Naphthalene compounds, Nutrients, Materials recovery, Chlorides.
Identifiers: *Waste water treatment, Poly (ethylene/ ((((naphthylmethyl)amino)methyl)p henyl)), Water pollution control.

Preparation of nitrate-specific ion-exchange resins, which incorporate selected primary amines grafted onto polystyrene, has been investigated. The best selectivity for nitrate ion over chloride ion was obtained with the 1-naphthylmethlaminomethyl derivative of polystyrene (1-NMA resin). Nitrate was adsorbed quantitatively from feed solutions containing five times as much chloride ion as nitrate ion. Under identical conditions, commercial weak-base resins removed only 70% of the nitrate ion. The 1-NMA resin could be regenerated repeatedly in the chloride form by HCl, but attempts at alkaline regeneration led to irreproducible results. Recommendations for future work include investigation of the effects of cross-linking, addition of hydrophilic functional groups, quaternization of the amine, and incorporation of different, nitrate-selective, functional groups. (Author)

PB-196 736
Halliburton Co., Duncan, Okla.
NEW MINE SEALING TECHNIQUES FOR WATER POLLUTION ABATEMENT.
Water pollution control research series.

Mar 70, 177p W71-03456, FWPCA-14010-DMO 03/70
Contract FWPCA-14-12-453
Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $1.50 as I67.13/4:14010-DMO-03/70.

Descriptors: (*Water pollution, *Mine waters), (*Coal mines, Sealing), (*Mine shafts, Sealing), Acidity, Limestone, Aggregates (Materials), Permeability, Grouting, Neutralizing, Subsurface drainage, Cements, Cost estimates, Sodium silicates, Feasibility, West Virginia, Bulkheads.
Identifiers: *Mine acid drainage, *Water pollution control.

The purpose was to develop and field test new concepts for watertight mine seal and bulkhead construction applicable to abatement of acid mine water pollution. Laboratory research determined proper materials, equipment and techniques for constructing mine seals or bulkheads. Field testing was conducted on remedial grouting techniques for constructing mine seals or bulkheads. Two new processes were developed. One involved a technique of placing a plug or graded limestone aggregate in a mine drift or portal to neutralize an acid mine water discharge until a seal was effected. The second process consisted of remotely constructing a mine seal including rear and front bulkheads of a self-supporting, quick-setting sodium silicate cement specifically developed for this application. A filler material of expansive cement was used between the bulkheads to complete the seal. Field testing in West Virginia substantiated the feasibility of both processes when two aggregate and two bulkhead type seals were placed in abandoned mines which had drainage flows up to 58 gallons per minute. Cost of the seals are reported. (Author)

PB-196 737
Atomics International, Canoga Park, Calif.
KINETICS AND MECHANISM OF PRECIPITATION AND NATURE OF THE PRECIPITATIE OBTAINED IN PHOSPHATE REMOVAL FROM WASTE WATER USING ALUMINUM (III) AND IRON (III) SALTS.
Water pollution control research series,
Howard L. Recht, and Masood Ghassemi. Apr 70, 87p* W71-03457, FWQA-17010-EKI-04/70
Contract FWQA-14-12-158
Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $0.75 as I67.13/4:17010-EKI-04/70.

Descriptors: (*Water pollution, Phosphates), (*Sewage treatment, *Phosphates), (*Precipitation (Chemistry), *Phosphorus inorganic acids), (*Aluminum, Sewage treatment), Iron, Evaluation, pH, Settling, Solubility, Precipitates, Turbidity, Nutrients, Chemical removal (Sewage treatment).

An investigation was conducted of the rate, mechanism and stoichiometry of phosphate precipitation with aluminum and ferric salts from pure phosphate solutions and secondary effluent. These studies showed that the reactions of orthophosphate ion with both Al (III) and Fe (III) are completed in less than 1 second. The effects of pH, reactant concentration, and reagent aging on the efficiency of phosphate removal were evaluated in batch precipitation experiments. The pH of optimum orthophosphate precipitation was found to be close to 6.0 for Al (III) and in the vicinity of 3.5 to 4.0 for Fe (III). At constant pH, with both Fe (III) and Al (III) up to about a 1:1 molar ratio, orthophosphate removal was directly proportional to amount of added cation, indicating occurrence of a chemical reaction. Dilute solutions of Fe (III) were found to undergo extensive hydrolysis on aging with a resultant loss of capacity to precipitate phosphate. The removal of condensed phosphates by precipitation with aluminum and iron salts was found to be strongly dependent on pH and the reactant concentration ratio. Precipitates obtained in the reaction of orthophosphate with aluminum and ferric salts were examined by X-ray diffraction analysis after drying and heating to 104C and to 600C. Both precipitates remained amorphous, except that ferric phosphate was identified after ignition at 600C. (WRSIC abstract)

PB-196 738
Atomics International, Canoga Park, Calif.
PHOSPHATE REMOVAL FROM WASTE WATERS USING LANTHANUM PRECIPITATION.
Water pollution control research series,
Howard L. Recht, and Masood Ghassemi. Apr 70, 54p* W71-03458, FWQA-17010-EFX-04/70
Contract FWQA-14-12-183
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.55 as 167.13/4: 17010-EFX-04-70.

Descriptors: (*Water pollution, Phosphates), (*Sewage treatment, *Phosphates), (*Precipitation (Chemistry), *Phosphorus inorganic acids), (*Lanthanum, Sewage treatment), Evaluation, Turbidity, pH, Solubility, Precipitates, Settling, Nutrients, Chemical removal (Sewage treatment).

A parametric study was made of the removal of ortho- and polyphosphates from pure solutions and secondary effluent with La (III), and the results compared with those from similar tests with Al (III). The reactions of orthophosphate with both La (III) and Al (III), resulting in precipitate formation and phosphate removal, were complete in less than 1 sec. La (III) showed a broader effective pH range and lower residual phosphate concentration and thus proved to be far superior to Al (III) for phosphate, especially polyphosphate, precipitation. Within the pH range for optimal phosphate removal, the La (III)-phosphate reactions produced large, settleable flocs. Immediately outside this range, poorly settling fine turbidity developed. At pH levels above this region, some residual turbidity was generally observed. No turbidity or precipitation was observed at very low pH levels. The results suggest that orthophosphate removal with La (III) occurs solely through a chemical reaction and not through an adsorption process. With secondary effluent, as with pure solutions, lower residual phosphate resulted over a wider pH range with La (III) than with Al (III); no pH adjustment is needed for effective removal with La (III), while considerable amounts of acid or excess Al (III) are required to achieve the optimum pH of 6 for phosphate removal. (WRSIC abstract)

PB-196 739
Grace (W.R.) and Co., Chicago, Ill. Dearborn Chemical Div.
ULTIMATE DISPOSAL OF PHOSPHATE FROM WASTE WATER BY RECOVERY AS FERTILIZER.
Water pollution control research series,
Maria G. Dunseth, Murrell L. Salutsky, Kenneth M. Ries, and Joseph J. Shapiro. Jan 70, 81p* W71-03459, FWQA-17070-ESJ-01/70
Contract FWQA-14-12-171

Paper copy available from Superintendent of Documents GPO, Washington, D.C. 20402. $0.70 as I67.13/4:17010-ESJ01/70.

Descriptors: (*Water pollution, Phosphates), (*Precipitation (Chemistry), *Phosphorus inorganic acids), (*Sewage treatment, *Phosphates), (*Fertilizers, Sewage treatment), (*Chemical removal (Sewage treatment), Phosphates), Digesters, Ammonium compounds, Magnesium inorganic compounds, Calcium phosphates, Heat treatment, pH, Activated sludge process.
Identifiers: *Ammonium magnesium phosphate.

Many of the proposed processes that reduce orthophosphate in the effluents from sewage treatment plants result in the extracted phosphate being concentrated in the digester supernatant. This phosphate must be removed prior to disposal of the supernatant or its recycle back to the head of the treatment plant. Digester supernatant was treated in two ways. The first was to add magnesia and elevate the pH to 9 to cause precipitation of the phosphorus. The other technique was to apply heat and/or vacuum to the digester supernatant which caused precipitation of the soluble orthophosphate. A 90% removal of orthophosphate can be achieved by either approach. The heat and/or vacuum process also yields a supernatant substantially lower in BOD, COD, and nitrogen concentration. The precipitated phosphorus (primarily a mixture of calcium phosphate and magnesium ammonium phosphate) was found available for plant food. Work was conducted by bench and pilot plant studies on digester supernatant.

PB-196 740
Grace (W. R.) and Co., Clarksville, Md.
CHEMICALLY EXFOLIATED VERMICULITE FOR REMOVAL OF PHOSPHATE FROM WASTEWATERS.
Water pollution control research series,
Jacob Block. Aug 69, 50p W71-03460,
FWQA-17010-DHK-08/69
Contract FWQA-14-12-485
Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $0.50 as I67.13/4:17010-DHK-08/69.

Descriptors: (*Water pollution, Phosphates), (*Sewage treatment, *Phosphates), (*Vermiculite, *Adsorbents), (*Ion exchanging, *Phosphorus inorganic acids), Aluminum inorganic compounds, Cost estimates, Economic engineering, Aluminum sulfates, Adsorption, Materials recovery, Nutrients, Chemical removal (Sewage treatment).

The objective of the study was to prepare a chemically treated vermiculite with a high phosphate capacity that could be economically regenerated. Many alumin um vermiculites were prepared and tested for phosphate removal. 10 mg PO4/gram of treated vermiculites was the maximum capacity obtained. Highest phosphate capacities were obtained with materials prepared at relatively low pH (3.0) and dilute aluminum solutions (0.1-0.05M). Experimental results showed hydroxylated aluminum vermiculite is inactive towards phosphate ion. The mole ratio of phosphate adsorbed to exchanged aluminum seemed to approach 0.33, or an exchange capacity of 13.7 mg PO4/gm. The most successful regeneration scheme was one in which a dilute sulfuric acid solution containing a small amount of Al2 (SO4)3 was used as a regenerant. No significant differences in capacity were found between thermally and chemically exfoliated vermiculite. Vermiculites containing cations other than Al were also prepared. These included Fe (III), Fe (II), La (III), and Cu (II). None appeared more promising than Al-vermiculite. The adsorption isotherm of aluminum-vermiculite was obtained, and the data were found to fit both the Langmuir and Freundlich plots. (WRSIC abstract)

PB-196 749
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
INVESTIGATION OF THE REACTIVITY OF LIMESTONE AND DOLOMITE FOR CAPTURING SO2 FROM FLUE GAS.
Summary rept. 29 May 69-30 Oct 70,
R. W. Coutant, R. E. Barrett, R. Simon, B. E. Campbell, and E. H. Lougher. 20 Nov 70, 76p*
APTD-0621
Contract PH-86-67-115
See also Summary report dated 27 Jun 69, PB-184 945.

Descriptors: (*Air pollution, *Sulfur dioxide), (*Adsorption, Sulfur dioxide), (*Adsorbents, *Limestone), (*Air pollution control equipment, *Fluegases), (*Dolomite (Rock), Adsorbents), Reaction kinetics, Roasting, Combustion products, Chemical reactors, Calcium sulfates, Chemical reactions.
Identifiers: Gas surface interactions, *Surface chemistry, *Air pollution control.

Improved experimental equipment and analytical techniques have enabled more detailed study of the reaction between Limestone 2061 and SO2 in flue gas. Progress was made in analysis of results and development of techniques for prediction of performance of the process in a boiler by means of both empirical and theoretical evaluation of various aspects of the process. Results obtained for Limestone 2061 indicate: (1) maximum reactivity at injection temperatures not exceeding about 2200 F, (2) reduced sorption efficiency at low SO2 concentration, (3) possible improvement in the efficiency of the process at excess oxygen levels above 3 percent, and (4) reduced efficiency as a result of use of precalcined stone. (Author)

PB-196 767
Cincinnati Univ., Ohio. Kettering Lab.
CLINICAL AND BIOCHEMICAL APPROACHES TO THE STUDY OF LEAD AT LOW LEVELS,
L. B. Tepper, and E. A. Pfitzer. Feb 70, 31p
APTD-0617
Contract PHS-CPA-70-14, Grant PHS-ES-00159

Descriptors: (*Lead inorganic compounds, Public health), (*Air pollution, Lead inorganic compounds), (*Public health, Air pollution), Diseases, Humans, Effectiveness, Lead (Metal), Absorption (Biology), Clinical medicine, Biochemistry, Diagnosis.

Discussions were held in February, 2970, which attempted to: (1) identify biochemical and clinical approaches to the detection of lead effects at low levels; (2) establish the health significance of whatever lead-related phenomena might be observed at these levels; and (3) suggest possible areas in which research emphasis might be most fruitful in solving the presented problems. Those discussions are summarized. Increasingly sophisticated methodology is being used to study the manifestations of excessive lead absorption. The state of current knowledge about how lead interacts with man and experimental living systems was reviewed. The best indicators of early response to lead are already in use. (Author)

PB-196 779
West Virginia Univ., Morgantown. Coal Research Bureau.
STUDY OF THE POTENTIAL FOR RECOVERING UNREACTED LIME FROM LIMESTONE MODIFIED FLYASH BY AGGLOMERATE.
Final rept.,
Charles F. Cockrell, Richard B. Muter, Joseph W. Leonard, and Ronald E. Anderson. May 70, 267p
APTD-0613
Contract PH-22-68-18, PHS-CPA-70-66

Descriptors: (*Air pollution, *Sulfur dioxide), (*Adsorbents, *Limestone), (*Adsorption, Sulfur dioxide), (*Fly ash, *Flotation), (*Calcium oxides, Flotation), Materials recovery, Feasibility, Zeta potential, Combustion products, Particle size, Froth, Scrubbers, pH, Flue gases, Dolomite (Rock), Thermogravimetric analysis, Calcium sulfates.
Identifiers: *Air pollution control, *Waste gas recovery.

The feasibility was studied of recovering the unreacted lime from limestone modified flyash by froth flotation of 200 x 325 mesh fractions. Grades of lime recovered were as high as 80 percent; 47.6 percent grade had been obtained in the preliminary tests. However, as lime grade increased, the recovery of lime decreased. This was attributed to the embedding of small siliceous particles in the lime constituents and the coating of the siliceous coal ash fraction with soluble lime. Tests have indicated that the lime may be liberated by attritional scrubbing and that carbonation and the use of chemical modifiers reduce coating of the siliceous coal ash fractions with lime. Employment of carbonation for pH and soluble lime control, modifiers for zeta potential control, agglomerate (emulsion) flotation and recleaning of the lime concentrates did not improve the yield and grade of lime to permit recovery of a majority of the lime in a highly concentrated form. (Author)

PB-196 780
Envirogenics Co., El Monte, Calif.
APPLICABILITY OF AQUEOUS SOLUTIONS TO THE REMOVAL OF SO2 FROM FLUE GASES. VOLUME I.
Final rept. 29 Dec 67-1 Sep 70,
L. E. Gressingh, A. F. Graefe, F. E. Miller, and H. Barber. Oct 70, 476p* APTD-0619
Contract PH-86-68-77
See also Volume 2, PB-196 781

Descriptors: (*Air pollution, Sulfur dioxide), (*Air pollution control equipment, *Scrubbers), (*Bibliographies, Air pollution control equipment), (*Adsorption, *Sulfur dioxide), (*Zinc oxide, Air pollution control equipment), (*Sodium sulfites, Adsorbents), (*Ammonia, Adsorbents), (*Hydrazine, Adsorbents), (*Limestone, Adsorbents), Oxidation, Feasibility, Economic analysis, Cost estimates, Fluidized bed processing, Roasting, Flue gases, Pilot plants, Operating costs, Calcium oxides, Manganese oxides, Magnesium oxides, Nitrogen dioxide, Combustion products, Materials recovery.
Identifiers: *Waste gas recovery, *Air pollution control.

The program included: literature survey; preliminary economic evaluation for comparative purposes; selection of candidate processes; and process simplification and improvement of each candidate existing process; demonstration of process feasibility of any candidate new process; plant-scale evaluation and cost estimates for the candidate processes to both new and existing power plant facilities and to a new smelter facility. Of the four candidate processes the Zinc Oxide process was considered to merit further study, both in the form of a fluidized bed and in the form of the original Na+ scrubbing process to the small-scale pilot stage. The three remaining candidate processes (Cominco Exorption, Ammonia-Hydrazine Exorption, and Mitsubishi Lime) are not considered to be as economically attractive as the original Johnstone process. A major problem confronting any aqueous process in which sulfur dioxide is recovered as such is that of oxidation in the scrubber. Nearly 700 references are listed, with an author index. (Author)

PB-196 781
Envirogenics Co., El Monte, Calif.
THE DEVELOPMENT OF NEW AND/OR IMPROVED AQUEOUS PROCESSES FOR REMOVING SO2 FROM FLUE GASES. VOLUME II.
Final rept.,
A. F. Graefe, L. E. Gressingh, and F. E. Miller. Oct 70, 172p* APTD-0620
Contract PH-86-68-77
See also Volume 1, PB-196 780.

Descriptors: (*Air pollution, Sulfur dioxide), (*Adsorption, *Sulfur dioxide), (*Zinc oxides, *Adsorbents), (*Air pollution control equipment, *Scrubbers), (*Sulfites, *Oxidation), Feasibility, Cost estimates, Economic analysis, Operating costs, Nitrogen oxides, Particle size, Fluidized bed processing, Roasting, Nitrogen dioxide, Flue gases, Materials recovery, Sodium sulfites, Carbonates, Magnesium oxides, Osmosis, Combustion products, Iron.
Identifiers: *Waste gas recovery, *Air pollution control.

Efficient absorption of SO2 at flue gas concentrations can be effected through the use of dry, fluidized basic materials in the range of 50 to 60 C, if sufficient water is incorporated into the gas phase upstream of sorbent contactor. The formation of sulfate can be essentially eliminated in a fluidized bed absorber, and reduced to a very low value in an aqueous absorber, through the use of ferrous ion in an aqueous prescrubber to reduce NO2 to NO. The thermal decomposition of both zinc and magnesium sulfites is markedly promoted by the presence of steam. A new process for the removal of SO2 from flue gas is described in which dry fluidized zinc oxide is used as the absorbent. The oxide is recovered for reuse upon thermal decomposition of the resulting sulfite, and the liberated SO2 is recovered as such. Little or no sulfate is formed. NOx (especially NO2) is the major contributor to oxidation of the sorbent in aqueous solution systems. The efficiency of SO2 removal from flue gas is not affected by the presence of NOx. The economics of the conceptualized fluidized-bed zinc oxide process appear to be superior to other regenerable processes for the removal of SO2 from flue gases. (Author)

PB-196 783
Dow Chemical Co., Midland, Mich. Organic Chemicals Dept.
EFFECT OF FUEL ADDITIVES IN THE CHEMICAL AND PHYSICAL CHARACTERISTICS IN AUTOMOTIVE EXHAUST.
Interim rept.,
John B. Moran, and Otto J. Manary. Jul 70, 176p*
APTD-0618
Contract PHS-CPA-22-69-145

Descriptors: (*Air pollution, *Exhaust gases), (*Fuel additives, Combustion products), (*Tetraethyl lead, *Combustion products), (*Particles, Air pollution), Antiknock additives, Particle size, Sampling, Hydrocarbons, Combustion deposites, Detergents, Scavengers (Materials), Gasoline, Nitrogen oxides, Lead halides, Chlorine organic compounds, Bromine organic compounds, Spark ignition engines, X-ray fluorescence, Electron microscopy, X-ray analysis, Ultraviolet spectra.
Identifiers: *Automobile exhausts, *Ethane/dibromo, *Ethane/dichloro.

Methods were developed of generating, collecting, and analyzing particulates in automotive engine exhaust by a means sufficiently accurate and reproducible to allow determination of the effects of fuel additives on exhaust particulate size, concentration, and composition. An air dilution chamber was designed which allows for cooling, dilution, and mixing so that representative particulate samples can be obtained at a sampling station which is essentially equivalent to 8 - 10 feet downstream of the end of the exhaust pipe on a vehicle at highway speeds. A 1970 Chevrolet 350 CID engine of 9.0:1 compression ratio with a standard exhaust system attached, was loaded by means of an engine dynamometer. Special analysis techniques were developed for the analysis and characterization of exhaust particulates. The data suggest a very significant effect of fuel additives, primarily tetraethyl lead, on exhaust particulate size, concentration and composition. Significant differences are observed with minor changes in other fuel additives. (Author)

PB-196 804
Tennessee Valley Authority, Muscle Shoals, Ala.
SULFUR OXIDE REMOVAL FROM POWER PLANT STACK GAS. AMMONIA SCRUBBING: PRODUCTION OF AMMONIUM SULFATE AND USE AS AN INTERMEDIATE IN PHOSPHATE FERTILIZER MANUFACTURE.
Conceptual design and cost study.

Sep 70, 324p* APTD-0615

Descriptors: (*Air pollution, Sulfur dioxide), (*Air pollution control equipment, *Scrubbers), (*Sulfur dioxide, *Adsorption), (*Ammonia, *Adsorbents), (*Ammonium sulfate, Materials recovery), (*Fertilizers, Materials recovery), Combustion products, Flue gases, Sulfites, Solutions, Cost estimates, Economic analysis, Operating costs, Chemical reactions, Design criteria, Reaction kinetics, Engineering drawings, Electric power plants, Coal.
Identifiers: *Waste gas recovery, *Air pollution control.

Ammonia scrubbing and production of phosphate fertilizer has promise, under certain conditions, as a method for recovering sulfur oxides from stack gases. The main economic factors are product volume (depending on power plant size and S content of coal), net sales revenue, and basis of financing. Private industry participation in financing and operation appears unlikely because of the high projected cash flow necessary to attract capital. There is a net profit for plants about 500 mw and larger but it is not large enough to attract investment except perhaps under special conditions. The situation is improved if there is supplemental income in the form of a payment for the service of sulfur oxide control; in this case the larger product volumes (e.g., 1000 mw at 3.5% S in coal or 500 mw at 5% S) give a projected total income adequate for financing. The economics under power industry financing are more promising. For plants 500-600 mw and larger in size the recovery method is favored over limestone - wet scrubbing because there is less deficit passed on to the power consumer after payment to investors of the regulated return on investment. Only a few recovery installations of this type can be accommodated by the fertilizer market. (Author)

PB-196 841
Esso Research and Engineering Co., Linden, N. J. Government Research Lab.
PROFILE STUDY OF AIR POLLUTION CONTROL ACTIVITIES IN FOREIGN COUNTRIES: FIRST-YEAR REPORT.
Homer J. Hall. Nov 70, 810p* APTD-0601
Contract PHS-CPA-22-69-68

Descriptors: (*Air pollution, *Organizations), Foreign governments, Government policies, Projects, Budget estimates, Indexes, Austria, Belgium, Denmark, France, West Germany, Great Britain, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, USSR.
Identifiers: *Foreign countries, *Air pollution control.

Over one thousand organizations dealing with air pollution control activities in 14 countries are included in the context of their functions in each country. Geography, political background, administration and finance of national and local control programs, current interests, proposed control programs and time tables for meeting goals are described in textual format for Austria, Belgium, Switzerland, Denmark, France, Great Britain, Italy, Japan, Norway, Netherlands, Sweden, and Soviet Union with similar descriptions for 19 international organizations. Where applicable publications relating to air pollution are also listed. Although cross-referenced in the text, each individual organization is outlined in aseparate section that is also divided by countries. The outline not only describes aims and functions but also key personnel and complete addresses. Functional and geographical cross-indexes within and across countries facilitate use on an issue-oriented basis. The report is a working document for preparing the second-year, supplemental report which will contain additional countries, as well as additional information for the countries already listed. (Author)

PB-196 977
Alaska Univ., College. Geophysical Inst.
STUDIES ON ICE FOG.
Final rept.,
Takeshi Ohtake. Jun 70, 204p UAG-R-211
APTD-0626
Contract PHS-AP-00449

Descriptors: (*Ice fog, Research), Air pollution, Condensation nuclei, Particle size, Nucleation, Dust, Freezing, Drops (Liquids), Precipitation (Meteorology), Electron microscopy, Water vapor, Condensing, Alaska.

In order to clarify the mechanism of ice-fog formation, various atmospheric factors in ice fogs such as size and concentration of ice-fog crystals, condensation nuclei and ice nuclei, amount of water vapor, temperature profile near the sources of ice fog, etc. were measured. Nuclei of the ice-fog crystals were studied by use of an electron microscope and electron-diffraction. Most nuclei of ice-fog crystals were combustion by-products and many individual crystals collected near open water did not have a nucleus, especially at emperatures below -40C. Dust particles or particles from air pollution are not essential for formation of ice fog; they merely stimulate freezing of water droplets at higher temperatures than the spontaneous freezing temperature. The essential factor is to first form many water droplets in the atmosphere through condensation of water vapor. Based on these measurements and calculations of time required for water droplets to freeze, a physical mechanism of ice fog formation is proposed as follows: (1) Water vapor coming from open water which is exposed to a low temperature atmosphere, plus water vapor from various exhausts of combustion processes is released into the almost ice-saturated atmosphere and condenses into water droplets, (2) The droplets freeze very shortly after their formation and before entirely evaporating, (3) Such ice particles do not evaporate or grow much and stay in the atmosphere with insignificant fall out, and (4) These processes operate more efficiently in colder environments. (Author)

PB-196 992
Bureau of Radiological Health, Rockville, Md. Div. of Biological Effects.
A REVIEW OF RADIUM TOXICITY STUDIES.
Technical rept.,
Richard P. Chiacchierini, Gordon L. Jessup, Neal S. Nelson, Norman C. Telles, and Edythalena Tompkins. Dec 70, 40p* BRH/DBE-70-5

Descriptors: (*Radium, Toxicity), Radiation dosage, Radiation effects, Thresholds (Perception), Sensitivity, Responses, Radiation tolerance, Public health, Humans, Animals.

The debate concerning the linear or threshold response of somatic radiation injury has recently been focused on the human radium toxicity studies. Because of the critical public health significance of the data derived from these studies, a task group from the Division of Biological Effects of the Bureau of Radiological Health undertook a review of the available human and animal radium studies for the purpose of determining the extent to which animal and human data are sufficient to resolve the questions of a dose-response relationship. The review contained in this report indicates that the animal and human radium experience to date is not sufficient to specify an unequivocal dose-response model. Therefore, in the low dose regions expected to be experienced by the general public, the assumption of a linear, non-threshold model continues to be a prudent health philosophy for standards setting. (Author)

PB-197 028
Stanford Research Inst., Menlo Park, Calif.
FEASIBILITY STUDY OF NEW SULFUR OXIDE CONTROL PROCESSES FOR APPLICATION TO SMELTERS AND POWER PLANTS. PART IV: THE WELLMAN-LORD SO2 RECOVERY PROCESS FOR APPLICATION TO POWER PLANT FLUE GASES.
Final rept.,
Konrad T. Semrau. Nov 70, 76p* APTD-0625
Contract PHS-CPA-22-69-78
See also Part 3, PB-197 168.

Descriptors: (*Air pollution, Sulfur dioxide), (*Electric power plants, Air pollution control equipment), (*Air pollution control equipment, *Sulfur dioxide), (*Adsorption, Sulfur dioxide), (*Adsorbents, *Sodium sulfites), Cost estimates, Operating costs, Feasibility, Materials recovery, Flue gases, Engineering costs, Oxidation, Fly ash, Desorption, Sulfuric acid.
Identifiers: *Wellman-Lord process, *Waste gas recovery, *Air pollution control.

The application of the Wellman-Lord SO2 recovery process to power plant flue gases is described. A block flow diagram was prepared. Mass and volume flow balances were estimated. Engineering estimates of the capital investment and the total annual cost (including both fixed and variable charges) were prepared. These engineering estimates were applied to previously created model gas streams and the total annual cost for each was determined. From these annual costs, incremental production costs were estimated. The technical constraints on the application and operation were qualitatively appraised; the economic constraints were appraised (quantitatively, to the extent permitted by the data). The current state of development was assessed, identifying any technological deficiencies whose elimination might enhance applicability. (Author)

PB-197 103
Environmental Protection Agency, Washington, D.C. Water Quality Office.
DOCUMENTATION REPORT. FWQA DYNAMIC ESTUARY MODEL.
Final rept.,
Kenneth D. Feigner, and Howard S. Harris. Jul 70, 261p EPA-WQO-DEM-70A

Descriptors: (*Estuaries, Mathematical models), (*Bays (Topographic features), Hydrodynamics), (*Water quality, Predictions), Diffusion, Transport properties, Mathematical prediction, Computerized simulation, Two dimensional flow, Equations of motion, Digital simulation, Computer programs, Finite difference theory.

The report documents the theory, development, verification, and application of a mathematical model which predicts the hydrodynamic and water quality behavior of well-mixed tidal rivers and estuaries. The two-dimensional hydrodynamic behavior is predicted by solving by finite difference methods the one-dimensional forms of the equations of motion and continuity applied to a two-dimensional non-uniform grid network which characterizes the prototype. This same network is utilized as the basis for predicting simultaneously the distributions of up to five conservative or non-conservative water quality constituents utilizing advective and diffusive transport mechanisms. The results of model verification and sensitivity studies are presented as well as complete documentation, including program listings, flow diagrams, input and output formats, and sample output. (Author)

PB-197 165
National Air Pollution Control Administration, Raleigh, N.C.
HYDROCARBONS AND AIR POLLUTION: AN ANNOTATED BIBLIOGRAPHY. PART I. CATEGORIES A TO E, AND PART II. CATEGORIES F TO M AND INDEXES.
Oct 70, 1184p* NAPCA-Pub-AP-75

Paper copy available from Superintendent of Documents, GPS, Washington, D.C. 20402. $5.00 per 2 Vol. set as FS2.300:AP-75.

Descriptors: (*Air pollution, *Hydrocarbons), (*Bibliographies, Hydrocarbons), Abstracts, Indexes (Documentation), Exhaust gases, Chemical reactions, Plants (Botany), Public health, Law (Jurisprudence), Standards.
Identifiers: *Air pollution detection, *Air pollution control, *Air pollution damage.

Approximately 2300 abstracts of technical literature related to hydrocarbons and air pollution are presented. The abstracted literature was collected from many sources; all are now included in the information retrieval system of the Air Pollution Technical Information Center (APTIC). Most of the literature is dated 1959 through 1970. The abstracts are arranged in thirteen broad subject categories. Four indexes are included: subject, title, author, and geographical location. The author index lists first and second (if any) authors individually. The geographical location index lists includes two sections: United States (states/localities); and Foreign (countries/cities). (Author)

PB-197 166
Stanford Research Inst., Menlo Park, Calif.
FEASIBILITY STUDY OF NEW SULFUR OXIDE CONTROL PROCESSES FOR APPLICATION TO SMELTERS AND POWER PLANTS. PART I: THE MONSANTO CAT-OX PROCESS FOR APPLICATION TO SMELTER GASES.
Final rept.,
Konrad T. Semrau. 1970, 57p APTD-0622
Contract PHS-CPA-22-69-78
See also Part 2, PB-197 167.

Descriptors: (*Air pollution, Sulfur dioxide), (*Air pollution control equipment, *Sulfur dioxide), (*Smelters, Air pollution control equipment), (*Adsorption, *Sulfur trioxide), Oxidation, Catalysts, Metallurgical furnaces, Fly ash, Cost estimates, Operating costs, Feasibility, Materials recovery, Flue gases, Engineering costs, Dust control, Corrosion, Sulfuric acid, Lead, Zinc, Copper.
Identifiers: *Cat-Ox process, *Air pollution control, *Waste gas recovery.

An evaluation was made of the Cat-Ox process for the air pollution control of smelters. A block flow diagram was prepared. Mass and volume flow balances were estimated. Engineering estimates of the capital investment and the total annual cost (including both fixed and variable charges) were prepared. These engineering estimates were applied to previously created model gas streams and the total annual cost for each was determined. From these annual costs, incremental production costs were estimated. The technical constraints on the application and operation were qualitatively appraised; the economic constraints were appraised (quantitatively, to the extent permitted by the data). The current state of development was assessed, identifying any technological deficiencies whose elimination might enhance applicability. (Author)

PB-197 167
Stanford Research Inst., Menlo Park, Calif.
FEASIBILITY STUDY OF NEW SULFUR OXIDE CONTROL PROCESSES FOR APPLICATION TO SMELTERS AND POWER PLANTS. PART II: THE WELLMAN-LORD SO2 RECOVERY PROCESS FOR APPLICATION TO SMELTER GASES.
Final rept.,
Konrad T. Semrau. 1970, 94p* APTD-0623
Contract PHS-CPA-22-69-78
See also Part 1, PB-197 166 and Part 3, PB-197 168.

Descriptors: (*Air pollution, Sulfur dioxide), (*Air pollution control equipment, *Sulfur dioxide), (*Smelters, Air pollution control equipment), (*Adsorption, Sulfur dioxide), (*Adsorbents, *Sodium sulfites), Metallurgical furnaces, Cost estimates, Operating costs, Feasibility, Materials recovery, Flue gases, Engineering costs, Oxidation, Copper, Lead, Zinc.
Identifiers: *Wellman-Lord process, *Waste gas recovery, *Air pollution control.

Discussed is the evaluation of the Wellman-Lord SO2 process for the control of SO2 from smelters. A block flow diagram was prepared. Mass and volume flow balances were estimated. Engineering estimates of the capital investment and the total annual cost (including both fixed and variable charges) were prepared. These engineering estimates were applied to previously created model gas streams and the total annual cost for each was determined. From these annual costs, incremental production costs were estimated. The technical constraints on the application and operation were qualitatively appraised; the economic constraints were appraised (quantitatively, to the extent permitted by the data). The current state of development was assessed, identifying any technological deficiencies whose elimination might enhance applicability. (Author)

PB-197 168
Stanford Research Inst., Menlo Park, Calif.
FEASIBILITY STUDY OF NEW SULFUR OXIDE CONTROL PROCESSES FOR APPLICATION TO SMELTERS AND POWER PLANTS. PART III: THE MONSANTO CAT-OX PROCESS FOR APPLICATION TO POWER PLANT FLUE GASES.
Final rept.,
Konrad T. Semrau. 1970, 71p* APTD-0624
Contract PHS-CPA-22-69-78
See also Part 2, PB-197 167.

Descriptors: (*Air pollution, Sulfur dioxide), (*Air pollution control equipment, *Sulfur dioxide), (*Electric power plants, Air pollution control equipment), (*Sulfur trioxide, *Adsorption), Oxidation, Catalysts, Metallurgical furnaces, Cost estimates, Operating costs, Feasibility, Materials recovery, Engineering costs, Sulfuric acid, Dust control, Fly ash, Lead, Zinc, Copper, Flue gases.
Identifiers: *Cat-Ox process, *Air pollution control, *Waste gas recovery.

An evaluation was made of the Cat-Ox process for the control of SO2 from electric power plants. A block flow diagram was prepared. Mass and volume flow balances were estimated. Engineering estimates of the capital investment and the total annual cost (including both fixed and variable charges) were prepared. These engineering estimates were applied to previously created model gas streams and the total annual cost for each was determined. From these annual costs, incremental production costs were estimated. The technical constraints on the application and operation were qualitatively appraised; the economic constraints were appraised (quantitatively, to the extent permitted by the data). The current state of development was assessed, identifying any technological deficiencies whose elimination might enhance applicability. (Author)

PB-197 262
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
INDUSTRIAL WASTE GUIDE ON THERMAL POLLUTION,
Alden G. Christianson, and Bruce A. Tichenor.
Sep 68, 121p W69-03537, FWPCA-16-30-09/68

Descriptors: (*Water pollution, Heat), (*Fishes, Water pollution), (*Fresh water biology, Water pollution), (*Marine biology, Water pollution), Industrial wastes, Reviews, Thermal power plants, Shellfish, Benthos, Algae, Aquatic plants, Cooling towers, Hydraulic models, Cooling water, Nuclear power plants, Metal industry, Chemical industry.
Identifiers: *Thermal pollution, *Water pollution damage, *Water pollution control, Cooling ponds, *Water pollution control equipment.

A guide to the sources, effects, and methods of control of thermal water pollution is presented to aid state, federal, and local regulatory personnel, community and regional planners, and industrialists in making sound decisions on handling hot discharges. A guide to more specific literature is included with a general description of the subject for the user's basic orientation. The general topics covered are heat loads from general industry, electric power, and manufacturing; physical, chemical, and biological effects; and methods of control and utilization of excess heat. A bibliography of 91 references is included. (WRSIC abstract)

PB-197 318
Environmental Protection Agency, Raleigh, N.C. Air Pollution Control Office.
GUIDELINES FOR LIMITATION OF CONTACT SULFURIC ACID PLANT EMISSIONS,
Jim Durham. Jan 71, 14p* APTD-0602

Descriptors: (*Air pollution, *Sulfur oxides), (*Chemical industry, Air pollution), (*Sulfuric acid, Air pollution), (*Sulfur dioxide, Air pollution), Recommendations, Sulfur trioxide, Contacting, Monitors, Sampling, Industrial wastes, Flue gases, Abatement.
Identifiers: *Air pollution control, *Air pollution detection.

The document was prepared to assist state and local regulatory agencies in the preparation of emission control regulations for contact sulfuric acid plants. The types and sources of air pollution in the contact sulfuric acid plant are discussed, and guidelines based on optimal use of available control technology are presented to assist agencies in developing regulations compatible with local conditions. Contact sulfuric acid plants can be designed to meet an SO2-tail-gas-emission ceiling of 6.5 lb/ton of acid produced. This is equivalent to the level attainable with both dual-absorption plants and commercially operating SO2-control processes. Appropriate equipment is commercially available and could be installed in all new and existing acid plants to reduce the acid mist emission levels to 0.5 lb/ton of acid produced. Efficient absorber operation can limit sulfur trioxide levels to 0.2 lb/ton acid produced on both new and existing installations. (Author)

PB-197 333
Environmental Protection Agency, Washington, D.C. Air Pollution Control Office.
AIR QUALITY CRITERIA FOR NITROGEN OXIDES.

Jan 71, 181p* NAPCA-Pub-AP-84
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.50 as No. FS2.300:AP-84.

Descriptors: (*Air pollution, *Nitrogen oxides), (*Photochemical reactions, Nitrogen oxides), (*Gas detectors, Nitrogen oxides), (*Atmospheric corrosion, Nitrogen oxides), (*Toxicity, Nitrogen oxides), (*Public health, Nitrogen oxides), Nitrogen dioxide, Nitrogen oxide (N2O), Nitrogen oxide (NO), Diurnal variation, Meteorological data, Concentration (Composition), Urban areas, Dyes, Textiles, Nickel alloys, Copper alloys, Plants (Botany), Epidemiology.
Identifiers: *Air pollution detection, *Air pollution effects (Materials), *Air pollution effects (Plants), *Air pollution effects (Animals).

The publication reviews the chemical and physical characteristics of the nitrogen oxides and considers the relative merit of various analytical methods for measuring them in the atmosphere. It also discusses their effects on visibility, vegetation, and materials; their toxicological effects on animals and on man; and epidemiological studies that assess the general population dose response and the specific response of children to nitrogen oxides. (Author)

PB-197 386
Mitre Corp., McLean, Va.
A SURVEY OF FUEL AND ENERGY INFORMATION SOURCES. VOLUME I,
D. L. Bobo, E. L. Keitz, J. Morris, and K. E. Yeager. Nov 70, 298p* MTR-1493-Vol-1
APTD-0627
Contract F19628-68-C-0365
See also Volume 2, PB-197 387.

Descriptors: (*Information retrieval, *Organizations), (*Fuels, Information retrieval), (*Energy, Information retrieval), Directories, Sources, National government, State government, Air pollution, Trade associations, Technical societies, Laboratories.
Identifiers: *Management information systems.

From 103 Federal, state, and independent information source agencies surveyed, the total number of fuel and energy related documents published is over 40,000. In addition this volume identifies 77 unpublished Federal fuel and energy related questionnaires which are circulated to 120,000 individual industrial corporations each year. The fuel and energy information source agencies are organized according to a set of management information descriptors developed by the study. (Author)

PB-197 387
Mitre Corp., McLean, Va.
A SURVEY OF FUEL AND ENERGY INFORMATION SOURCES. VOLUME II. FEDERAL QUESTIONNAIRES,
D. L. Bobo, E. L. Keitz, J. Morris, and K. E. Yeager. Nov 70, 631p* MTR-1493-Vol-2
APTD-0628
Contract F19628-68-C-0365
See also Volume 1, PB-197 386.

Descriptors: (*Information retrieval, *Organizations), (*Fuels, Information retrieval), (*Energy, Information retrieval), Directories, Air pollution, Sources, National government, Questionnaires.
Identifiers: *Management information systems.

The 77 unpublished Federal fuel and energy related questionnaires identified and described in Volume I of this survey are reproduced. (Author)

PB-197 446
Island Creek Coal Co., Holden W. VA. Island Creek Div.
FEASIBILITY STUDY OF MINING COAL IN AN OXYGEN FREE ATMOSPHERE. A DEMONSTRATION OF A NEW MINING TECHNIQUE TO PREVENT THE FORMATION OF MINE ACID IN AN ACTIVE DEEP MINE, PHASE I.
Water pollution control series.

Aug 70, 170p W71-04187, FWQA-14010-DZM-08/70
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.50 as I67:13/4:14010DZM08/70.

Descriptors: (*Coal mining, Inert atmospheres), (*Mining, Controlled atmospheres), (*Gasproof clothing, Coal mining), Mine waters, Methane, Fire safety, Feasibility, Life support systems, Carbon dioxide, Nitrogen Personnel development, Radio equipment, Cost estimates.
Identifiers: *Mine safety, *Mine acid drainage, Water pollution control.

A systems evaluation was made to determine the engineering feasibility and probable economics of mining coal in an active deep mine in an oxygen free atmosphere using current technology in the application of life support systems to conventional coal mining techniques. A detailed investigation was conducted into the application and suitability of commercially available inert gas generators, life support clothing and equipment, and personnel communications systems. Three sites were investigated for a demonstration mine. The investigation revealed it is feasible from an engineering standpoint to mine coal in an oxygen free atmosphere. Life support and associated equipment are available essentially off-the-shelf. A deep mine using conventional mining equipment can be designed to operate in an oxygen free atmosphere. The comparative economics are extremely favorable when methane gas is recovered and sold. (Author)

PB-197 447
Muskegon County Board, Mich. Dept. of Public Works.
ENGINEERING FEASIBILITY DEMONSTRATION STUDY FOR MUSKEGON COUNTY, MICHIGAN. WASTEWATER TREATMENT-IRRIGATION SYSTEM.
Water pollution control series.

Sep 70, 180p W71-04186, FWQA-11010-FMY-10/70
Paper copy available from Superintendent of Documents, GPO, Washing[illegible], D.C. 20402. $1.50 as I67:13/4:11010FMY10/[illegible]

Descriptors: (*Sewage treatment, Lagoons (Ponds)), (*Industrial waste treatment, Lagoons (Ponds)), (*Irrigation, *Water reclamation), Michigan, Subsurface drainage, Trace elements, Water quality, Water resources, Tile drains, Agricultural engineering.
Identifiers: *Muskegon County (Michigan).

The feasibility of a lagoon treatment-spray irrigation system for the combined domestic wastes and industrial wastewaters in Muskegon County, Michigan, was investigated in this study. The largest volume of industrial wastewaters are those discharged by a pulp and paper mill. Various aspects of the project were investigated including: (1) sampling and analyses of wastewaters for a variety of parameters, (2) a review of available information concerning the effect of trace elements on soils and crops, (3) laboratory tests of the treatability of the combined wastewaters by lagoon treatment, (4) development of a simulation model to assist in analyzing the volume and water quality aspects of a treated wastewater storage lagoon, (5) soils and groundwater field and office studies regarding the management of groundwater levels to ensure an adequate aerobic treatment zone in the soil as well as to prevent ponding in the site area, and (6) investigations of certain agricultural aspects in using treated wastewaters as spray irrigation water. (Author)

PB-197 448
Gulf General Atomic, Inc., San Diego, Calif.
MEMBRANE MATERIALS FOR WASTEWATER RECLAMATION BY REVERSE OSMOSIS,
A. S. Douglas, M. Tagami, and C. E. Milstead. Jun 70, 75p W71-04185, FWQA-17040-EFO-06/70
Contract FWQA-14-12-452
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.65 as 17040EFO 06/70.

Descriptors: (*Sewage treatment, *Osmosis), (*Membranes, Osmosis), (*Cellulose acetate, Membranes), (*Water reclamation, Osmosis), Chemical removal (Sewage treatment), Demineralizing, Polyurethane resins, Polyelectrolytes, Pyrrolidines, Tests.
Identifiers: *Reverse osmosis, Tertiary sewage treatment, Polyvinyl pyrrolidone.

An experimental program was carried out to evaluate potential reverse osmosis membranes for the tertiary treatment of secondary sewage effluent. The evaluation program consisted of both direct osmosis and reverse osmosis tests on various membranes using both single solutes and secondary effluent. The types of membranes tested were polyurethane latices, cellulose diacetate, cellulose 2.5-acetate, polyvinylpyrrolidone (PVP)-polyisocyanate interpolymers, and polyelectrolytes. The cellulose diacetate, polyurethane latices, and PVP

membranes were not suitable for waste-water treatment. Although rejection of most solutes by PVP membranes was quite good for dense, homogeneous membranes, high-flux, asymmetric membranes had poor rejection characteristics. Very-high flux membranes were prepared from polyacrylic acid cast onto cellulose nitrate, cellulose nitrate-cellulose acetate, and polysulfone porous supports. The best combination of high flux and rejection was obtained wtih asymmetric cellulose 2.5-acetate membranes heat-treated in water at 55 to 70C. (Author)

PB-197 470
Horizons, Inc., Cleveland, Ohio.
TREATMENT OF ACID MINE DRAINAGE,
J. J. Bikerman, P. J. Hanson, and S. H. Rose. Dec 70, 100p W71-04188, FWQA-14010-DEE-12/70
Contract FWQA-14-12-496
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.00 as I67.13/4:14010DEE12/70.

Descriptors: (*Water pollution, *Mine waters), (*Coal mines, Water pollution), (*Iron, *Chemical removal (Water treatment)), Surfactants, Manganese, Calcium, Magnesium, Cost estimates, Neutralizing, Limestone.
Identifiers: *Mine acid drainage, *Water pollution control, *Foam fractionation.

Basic experiments were conducted to establish the feasibility of foam fractionation in the treatment of acid coal mine drainage for the removal of the metal ions iron, calcium, manganese and magnesium. The independent variables controlling foam separation of metal ions were determined to be the concentration ratio of surfactant to iron, the air volume throughput, the foam drainage time, the total dissolved salt content and the type of surfactant used. The major part of iron, calcium, manganese and magnesium can be foam separated from acid solution by proper control of the independent variables. Reduction of residual surfactant concentration in the treated water and reduction of water entrained with the foam are two areas in need of further investigation. Foam separation was tested on acid drainage, partially lime neutralized drainage and complete limestone neutralized drainage. Tests on model solutions indicate that treatment of raw acid drainage is most feasible at present. Operating and capital costs are estimated for 0.1 and 1.0 MGD batch treatment plants. (Author)

PB-197 471
Robert A. Taft Water Research Center, Cincinnati, Ohio.
NEUTRALIZATION OF HIGH FERRIC IRON ACID MINE DRAINAGE,
Roger C. Wilmoth, and Ronald D. Hill. Aug 70, 48p W71-04189, FWQA-14010-ETV-08/70
See also report dated May 70, PB-192 087. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402, $0.50 as I67.13/4:14010ETV08/0.

Descriptors: (*Water pollution, *Mine waters), (*Coal mines, Water pollution), (*Neutralizing, Mine waters), (*Iron, *Chemical removal (Water treatment)), Limestone, Calcium oxides, Sodium carbonates, pH, Cost estimates, Water quality, Particles, Aeration, Pilot plants, Field tests, Sedimentation tanks.
Identifiers: *Mine acid drainage, *Water pollution control.

Lime, limestone, and soda ash were studied as neutralizing agents for treatment of a ferric iron acid mine drainage water. Both continuous flow and batch tests were used to determine the effectiveness of each of these neutralizing agents in reaction with acid mine water. Comparisons made between the three neutralizing agents include: chemical costs, reaction efficiencies, effluent water qualities, sludge settling rates, sludge volumes, and percent solids of sludges. All three neutralizing agents were capable of treating acid mine drainage. Lime costs were half that of limestone for treating the same acid mine drainage because of the low utilization of limestone. However, the characteristics of the limestone sludge were superior to those of lime and soda ash sludges. The cost for soda ash treatment was excessive. Further research on improving limestone utilization is under way. No difference in reaction efficiency were found in dry feeding or slurry feeding the neutralizing agents. Aeration during and/or after the limestone reaction merely increased the effluent pH but failed to increase limestone useage efficiency or improve effluent quality. (Author)

PB-197 594
NUS Corp., Pittsburgh, Pa. Cyrus Wm. Rice Div.
FEASIBILITY STUDY MANUAL-MINE WATER POLLUTION CONTROL DEMONSTRATIONS.
Water pollution control research series.

Jun 70, 71p W71-04545, FWQA-19010-FLW-07/70
Contract FWQA-DI-14-12-848
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.65 as I67.13/4:14010FLW.

Descriptors: (*Water pollution, *Mine waters), (*Project planning, Mine waters), Manuals, Grants, Feasibility, Cost estimates, Engineering, Abatement.
Identifiers: *Water pollution control, *Mine acid drainage.

The manual is to be used as a guide by State or Interstate agencies in uniformly performing feasibility studies for projects proposed to demonstrate methods for the abatement of mine drainage pollution as required by Section 14 of the Federal Water Pollution Control Act as amended. The required feasibility studies are to aid the Secretary of the Interior in selecting the mine drainage pollution control method or methods suitable for demonstration, and also the optimum watershed where the effectiveness of the project will have the greatest public value or uses. (Author)

PB-197 595
Federal Water Quality Administration, San Francisco, Calif.
COLLECTED PAPERS REGARDING NITRATES IN AGRICULTURAL WASTE WATER.
Water pollution control Research series.

Dec 69, 192p W71-04546, FWQA-13030-ELY-12/69
Prepared in cooperation with Bureau of Reclamation, Sacramento, Calif., and the California Dept. of Water Resources, Sacramento. Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.50 as I67.13/4:13030ELY.

Descriptors: (*Water pollution, *Nitrates), (*Fertilizers, Water pollution), (*Nutrients, Water pollution), (*Hydrology, Water pollution), (*Denitration, Subsurface drainage), Soil chemistry, Watersheds, Algae, California, Monitors, Desalting, Osmosis, Electrodialysis.
Identifiers: *San Joaquin Valley, *Water pollution control.

The report is comprised of a collection of 11 papers dealing with the closely related topics of (a) concentrations of nitrates occurring in subsurface agricultural waste waters, (b) the source of nitrates, and (c) possible methods for controlling or removing them. The work all deals with subsurface agricultural waste waters of the San Joaquin Valley in California, but much of the information may have general application. (WRSIC abstract)

PB-197 596
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
CONTROL OF SPILLAGE OF HAZARDOUS POLLUTING SUBSTANCES.
Water pollution control research series,
G. W. Dawson, A. J. Shuckrow, and W. H. Swift. 1 Nov 70, 409p* W71-04615, FWQA-15090-FQZ-10/70
Contract FWQA-14-12-866
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $3.00 as I67.13/4-15090FQZ10/70.

Descriptors: (*Hazardous materials, *Water pollution), (*Reviews, Hazardous materials), (*Highway transportation, Water pollution), (*Water transportation, Water pollution), (*Rail transportation, Water pollution), Classifications, Toxicity, Water quality, Government policies, Detection, National government, Accidents, Fish, Recommendations, Monitors, Tabels (Data).
Identifiers: *Water pollution detection, *Water pollution effects (Plants), *Water pollution effects (Animals), Law (Jurisprudence), Pesticides, Fertilizers, Chemical industry, Phenols.

An evaluation of the water quality aspects germane to the spillage of hazardous polluting substances is developed. Emphasis is placed on definition and classification of chemical materials; the nature of the sources of spillage and past experience; and analysis of the relative threat to water quality offered by such substances; a review of presently available detection, control, and removal technology; relationship to water quality standards; and the relevant administrative, enforcement, and cost recovery aspects. Over 800 chemical substances were evaluated as to their annual production and transport quantities, their critical concentration in the aquatic environment resulting in water quality impairment for the several beneficial water uses, detection limits (both field and laboratory), and the control and removal methods presently available or potentially practicable. Over 250 chemicals and compounds, generally those in large scale production and utilization, are priority ranked in order of relative threat to water quality in terms of annual production/sales, intrinsic hazard to water quality, transport mode, and past statistical accident frequency. Recommendations are presented regarding future research and development efforts aimed at mitigating damage and a consensus of informed parties is presented relating to the need for additional legislation. (Author)

PB-197 597
Burns and Roe, Inc., Oradell, N.J.
DISPOSAL OF BRINES PRODUCED IN RENOVATION OF MUNICIPAL WASTE-WATER.
Water pollution control research series.

May 70, 122p W71-04614, FWQA-17070DLY-05/70
Contract FWQA-14-12-492
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25 as I67.13/4:17070DLY.

Descriptors: (*Sewage treatment, *Desalting), (*Water pollution, Brines), (*Water reclamation, Desalting), (*Waste disposal, *Brines), (*Injection wells, Waste disposal), Salt water, Cost estimates, Evaporation, Flashing, Pipe transportation, Hydrology, Electrodialysis, Operating costs.
Identifiers: *Water pollution control, *Denver (Colorado), *El Paso (Texas), *Tucson (Arizona).

Costs of ultimate disposal of brine wastes from municipal water renovation schemes have been investigated for the sites of El Paso, Texas, Tucson, Arizona and Denver, Colorado. Based on 10 million gallons per day, 7% fixed charge rate, and 12 mills/Kwhr power cost, estimated costs were found. (Author)

PB-197 598
Weston (Roy F.), Inc., West Chester, Pa.

CONCEPTUAL ENGINEERING REPORT - KINGMAN LAKE PROJECT.
Water pollution control research series.

Aug 70, 162p W71-04616, FWQA-11023-FIX-08/70
Contract FWQA-14-12-829
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25 as I67.13/4:11023FIX.

Descriptors: (*District of Columbia, *Recreational facilities), (*Lakes, *Urban planning), (*Combined sewers, *Water reclamation), (*Water pollution, Sewage), Overflows, Storm sewers, Sewage treatment, Swimming pools, Cost estimates, Feasibility, Surface water runoff, Flocculating, Sedimentation, Disinfection, Reservoirs, Rainfall, Sanitary engineering, Water treatment.
Identifiers: *Kingman Lake, *Water pollution control.

This conceptual engineering study concerns the reclamation of combined sewer overflows and utilization of the reclaimed waters in a major water-oriented recreational facility for the District of Columbia. The investigation encompasses a comprehensive solution of environmental problems by proposing multi-use objectives and facilities. Principal objectives of the project included: (1) evaluation of rainfall runoff relationships for sizing of storage and treatment plant capacities; (2) confirmation of treatment feasibility using filtration and an activated carbon process; and (3) development of sufficient data for preliminary design purposes. Laboratory studies not only demonstrated process feasibility, but showed the need for including flocculation and sedimentation for removal of minute particles, together with chlorine and iodine addition for maximum disinfection. The recommended storage/treatment plan provides for a 175 million gallon storage basin, a 50 million-gallon-per-day reclamation facility and two 46-acre swimming and boating lakes. Cost effectiveness (Cost/Benefit Ratio) of the project are given. (Author)

PB-197 599
General Dynamics Corp., Groton, Conn. Electric Boat Div.
A STUDY OF FLOW REDUCTION AND TREATMENT OF WASTE WATER FROM HOUSEHOLDS.
Water pollution control research series,
James R. Bailey, Richard J. Benoit, John L. Dodson, James M. Robb, and Harold Wallman.
Dec 69, 168p W71-04617, FWQA-11050FKE-12/69
Contract FWQA-14-12-428
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.25 as I67.13/4-11050FKE.

Descriptors: (*Water consumption, Houses), (*Attitude surveys, Water consumption), (*Sewage treatment, *Houses), (*Toilet facilities, Water conservation), (*Plumbing, Water conservation), Reviews, Water quality, Septic tanks, Sanitary engineering, Osmosis, Electrodialysis, Electrolysis, Water conservation, Toilet facilities, Cost estimates.

The literature on household water quantity and quality requirements was reviewed, an average water use pattern postulated, and the amount of water used in various households functions was estimated. Comparisons of different water saving devices were made on a cost basis. Water quality is considered from three points of view: health, aesthetics, and engineering suitabil,ity. The future water demands may necessitate very strict disposal requirements and multiple water quality levels although the present standards do not tend to allow the use of several levels of water quality such as using laundering effluent for toilet flushing. Waste disposal problems of homes not connected to central sewerage systems were discussed. Septic tanks, change of phase processes, membrane processes, electrolytic processes, and other processes were evaluated, mainly on a cost basis. Most of the methods considered do not appear to be suitable for individual households at this time but with changes in economic factors and technical improvements some of these methods may be attractive for future use. A survey of homeowners, architects-engineers, plumbers and plumbing equipment manufacturers was conducted to obtain representative reactions to methods used to control water quantity and quality and waste water treatment processes. (Author)

PB-197 623
National Research Council, Washington, D.C. Building Research Advisory Board.
COLLECTION, REDUCTION, AND DISPOSAL OF SOLID WASTE IN HIGH-RISE MULTIFAMILY DWELLINGS.
Interim rept.
1971, 184p* EPA-SW-27C.I-71
Contract PH-86-67-167

Descriptors: (*Apartment buildings, *Refuse disposal), (*Incinerators, Refuse disposal), (*Compacting, Refuse disposal), (*Grinding (Comminution), Refuse disposal), Evaluation, Field tests, Cost estimates, Air pollution, Garbage disposal, Sanitary engineering.
Identifiers: *Solid waste disposal.

The report discusses three alternative methods of handling solid waste in high-rise multifamily housing: incineration, compaction, and wet pulverization. This interim report presents, in narrative form, the results of the first study period of the three-study-period program. Conclusions and recommendations are yet to be formulated. The report covers: (1) the objectives and scope of the project, (2) the work to be accomplished during each of the study periods, (3) the method of conducting the project, and (4) the test structures used. In addition, the existing conditions at the test structures are assessed, including the quantity and composition of the refuse, the number and age of the tenants, the contribution to air pollution by incinerators, the degree of vermin and insect infestation, the personnel and power requirements, the cost, the effectiveness and limitations, and the acceptance by owners, tenants, and custodians. The tentative data-collection program and refuse-handling equipment to be installed for the second study period are discussed. (Author)

PB-197 627
Scott Research Labs., Inc., Plumsteadville, Pa.
A STUDY OF EXHAUST EMISSIONS FROM RECIPROCATING AIRCRAFT POWER PLANTS.
Final rept.

28 Dec 70, 87p*
Contract CPA-22-69-129

Descriptors: (*Air pollution, Exhaust gases), (*Aircraft engines, *Exhaust gases), Afterburning, Reciprocating engines, Combustion products, Carbon dioxide, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Field tests.

The report document the exhaust emission of light, piston engine aircraft and the phenomena of natural afterburning of the exhaust gases on contact with the ambient air. The approach used in the study was to measure the exhaust emissions of representative aircraft as they were flown in a normal manner. At the same time, the extent of afterburning was measured by sampling the exhaust plume downstream of the exhaust stack and comparing the plume composition, corrected for dilution, to the composition of the stack gases. The exhaust emissions from nine light aircraft were determined using a 9-mode takeoff-cruise-landing (TCL) cycle developed for this study. Exhaust component concentrations and fuel consumption rates were measured for each mode during ten test flights per aircraft. The pollutant concentrations were converted to emission rates per pound of fuel, per minute, per mode, per TCL cycle, and per landing-takeoff (LTO) cycle. (Author)

PB-197 647
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
COMPREHENSIVE STUDY OF SPECIFIED AIR POLLUTION SOURCES TO ASSESS THE ECONOMIC EFFECTS OF AIR QUALITY STANDARDS.
Final rept.,
D. A. LeSourd, M. E. Fogel, A. R. Schleicher, T. E. Bingham, and R. W. Gerstle. Dec 70, 409p*
RTI-FR-OU-534-Vol-1 APTD-0632
Contract PHS-CPA-70-60

Descriptors: (*Air pollution, Cost estimates), (*Economic surveys, Air pollution), (*Air pollution control equipment, Cost estimates), (*Industrial waste treatment, Economic surveys), Abatement, Hydrocarbons, Carbon monoxide, Nitrogen oxides, Particles, Sulfur dioxide, Fluorides, Lead, Urban areas, Prices, Exhaust gases, Fuels, Metal industry, Chemical industry, Paper industry, Petroleum industry.
Identifiers: *Air pollution control.

Estimates were made of the costs of controlling and reducing the emissions of selected pollutants from mobile sources within the Nation and pollutants from 23 stationary sources within 298 metropolitan areas. Under the assumed implementation plan, these estimated costs are those that will be incurred during the period of Fiscal Year 1971 through Fiscal Year 1976. In addition, an extended analysis was made to determine the economic impact of control costs on each industrial source or group of industrial sources studied. Also, the aggregate effects of the impact of individual industries upon buyer industries and consumer prices are determined. The pollutants from mobile sources selected for analysis are hydrocarbons, carbon monoxide, nitrogen oxides and particulates. The six pollutants for which control cost estimates are made for stationary sources are particulates, sulfur oxides, carbon monoxide, hydrocarbons, fluorides, and lead. Emission standards applied are considered stringent in comparison with many currently in use throughout the Nation. (Author)

PB-197 652
Environmental Protection Agency, Research Triangle Park, N.C. Air Pollution Control Office.
ATMOSPHERIC EMISSIONS FROM CHLOR-ALKALI MANUFACTURE.

Jan 71, 116p AP-80
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.55 as FS2.300:AP-80.

Descriptors: (*Air pollution, *Industrial wastes), (*Chemical industry, Air pollution), (*Chlorine, Air pollution), Electrolytic cells, Sodium hydroxide, Air pollution control equipment, Carbon dioxide, Carbon monoxide, Mercury, Chemical analysis, Sampling, Scrubbers, Process variables.
Identifiers: *Air pollution detection.

The manufacture of chlorine and related products is generally known as the chlor-alkali industry. A description is given of the electrolytic process. Process information includes the discussion of normal process variables that affect the range and quantities of emissions and methods of controlling or reducing emissions. Supplemental material provides detailed emission-sampling and analytical methods. Information is provided on the range of emissions that occur under normal operating conditions and with the use of established methods and devices employed to limit or control emissions from the manufacture of chlorine and caustic. The emissions and operating data results from approximately 15 percent of present establishments, representing a broad range of plant capacities and both diaphragm and mercury cells. Most of these

data have been gathered from production records of chlorine and caustic manufacturers. (Author)

PB-197 658
Envirogenics Co., El Monte, Calif.
A STUDY OF NITRIFICATION AND DENITRIFICATION.
Water pollution control series,
Byron J. Mechalas, Paul H. Allen, III, and Walter W. Matyskiela. Jul 70, 105p W71-04667, FWQA-17010-DRD-07/70
Contract FWQA-14-12-498
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.00 as I67.13/4:17010DRD07/70.

Descriptors: (*Sewage treatment, *Denitration), (*Chemical removal (Sewage treatment), *Nitrates), Nutrients, Nitration, Biochemical oxygen demand, Reaction kinetics, Aerobic processes, Mathematical models, Ammonia, Oxidation.
Identifiers: Tertiary sewage treatment, Chemical oxygen demand.

A program to incorporate biological denitrification into a waste water treatment system was undertaken with the objective of developing a process that depends exclusively on the carbon compounds contained in the waste water to supply metabolic energy to the microflora. In the experimental program the incoming nitrogenous material was oxidized to nitrate in an aerobic phase and reduced to nitrogen gas in an anaerobic phase. Conditions for developing a nitrifying microflora were investigated using a primary waste water effluent as feed. Anaerobic batch experiments were carried out to determine if stored reserves could support denitrification. Under appropriate conditions almost 100% of the nitrates could be reduced. The effluent from the aerobic unit served as the feed for the anaerobic process. At appropriate intervals this situation was reversed by switching the airflows and feed sources. Over 95% of the waste water nitrogen in waste water was removed. Nitrate-nitrogen removal rates ranged from 0.600 to 1.00 mg/hr/g MLVS. A mathematical model was developed which described the response to cycled aerobic-anaerobic operation. The alternating cycle approach was shown to be an effective method for removing nitrogen from waste water. (Author)

PB-197 659
Aerojet-General Corp., El Monte, Calif. Environmental Systems Div.
REVERSE OSMOSIS RENOVATION OF MUNICIPAL WASTE WATER.

1971, 172p W71-04669, FWQA-17040-EFQ-12/69
Contract FWQA-14-12-184
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $1.50 as I67.13/4:17040-EFQ12/69.

Descriptors: (*Sewage treatment, *Osmosis), (*Demineralization, Sewage treatment), (*Cellulose acetate, Membranes), Chemical removal (Sewage treatment), Mathematical models, Nitrates, Phosphates, Ammonium compounds, Organic compounds.
Identifiers: *Reverse osmosis.

A fifteen-month laboratory program has shown that all grades of municipal waste water may be significantly improved by the reverse osmosis process. Comparisons are provided on the behavior and response of the reverse osmosis process to carbon-treated secondary sewage, alum-treated secondary sewage, secondary sewage, primary settled sewage, raw sewage, and digester supernatant. High removals of dissolved minerals, organic substances, and suspended matter have all been achieved in the same treatment. The effects of a flocculant, dispersant, chelating agent, enzyme, and acid on reducing product water flux decline are compared. The relative effects of reverse osmosis test-cell geometry on solids deposition and membrane performance are presented. A phenomenological model is postulated describing the role of undissolved solids and organic substances in producing product water flux decline and the subsequent maintenance of constant product water fluxes. A computer model of the reverse osmosis process has been developed to provide an accurate and rapid method of determining the design and cost of reverse osmosis facilities. (Author)

PB-197 668
California Univ., Riverside. Dept. of Economics.
URBAN AIR POLLUTION DAMAGE FUNCTIONS: THEORY AND MEASUREMENT.
Final rept.,
Thomas D. Crocker. 1970, 116p* APTD-0631
Contract PHS-CPA-22-69-52
Appendix inserted. Prepared in cooperation with Purdue Univ., Lafayette, Ind. and Wisconsin Univ., Madison.

Descriptors: (*Air pollution, *Economic analysis), Urban areas, Damage, Present worth, Economic forecasting, Prices, Cost estimates, Land, Residential buildings, Highways.
Identifiers: *Air pollution effects (Materials).

The urban air pollution damage function as it is registered in differential market prices of residential property was investigated. By using somewhat more complex specifications and a set of data appearing to have greater informational content, the sensitivity of damage functions derived by means of differential land values to differential land values to differences in specifications and differences in data was ascertained. If results do not appear overly sensitive to data and specification differences, then simpler and less costly specifications and data sets can be used to obtain the damage function with little or no loss in information. Everything else being equal, a control instrument more likely to approach a continuing minimization of the sum of emitter control costs and receptor damage costs can then be employed. Less obtusely stated, the question being asked here is whether any additional worthwhile information about urban air pollution damage functions can be obtained by working with property value models having somewhat more complex specifications and more complete data than in previous studies. (Author)

PB-197 669
Melpar, Falls Church, Va.
COMBINED SEWER TEMPORARY UNDERWATER STORAGE FACILITY.
Water pollution control series.

Oct 70, 89p* W71-04668, FWQA-11022-DPP-10/70
Contract DI-14-12-133
Paper copy available from Superintendent of Documents GPO, Washington, D.C. 20402. $1.75 as I67.13/4:11022-DPP-10/70.

Descriptors: (*Combined sewers, Storage tanks), (*Storage tanks, Underwater structures), (*Surface water runoff, Storage tanks), Overflows, Water pollution, Feasibility, Public opinion, Pumping stations, Steel structures, Coverings, Coated fabrics, Cost effectiveness, Maryland.
Identifiers: *Underwater storage, Cambridge (Maryland), Flexible structures.

A pilot plant underwater storage facility was designed, constructed, operated and evaluated as in a method of temporarily storing storm overflow from a combined sewer in Cambridge, Maryland. Combined sewage in excess of the sewer capacity, which would normally be discharged directly into the Choptank River, was intercepted an pumped into a nominal 200,000 gallon flexible underwater storage container located 1300 feet offshore. The stored overflow was later returned from the tank at a rate which could be accommodated by the intercepting sewer and treatment plant. The facility was tested with overflow both from four naturally occurring rainfalls and using fresh water simulation. The overflow samples were analyzed in a field laboratory for the following characteristics: pH, suspended solids, volatile suspended solids, settleable solids, 5 day biochemical oxygen demand, and chemical oxygen demand. (Author)

PB-197 670
California Univ., Santa Barbara.
SANTA BARBARA OIL POLLUTION, 1969.
Water pollution control series,
A. Foster, M. Neushul, A. C. Charters, and R. Zingmark. Oct 70, 56p* W71-04670, FWPCA-15080-DZR-10/70
Report on A Study of the Biological Effects of the Oil Spill which Occurred at Santa Barbara, California, in 1969. Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. $0.55 as I67.13/4:15080-DZR-11/70.

Descriptors: (*Water pollution, Oils), (*Marine biology, Water pollution), Aquatic plants, Ocean currents, Phaeophyta, Barnacles, Coasts, California.
Identifiers: Oil pollution, *Santa Barbara (California), *Water pollution effects (Plants).

The initial flow of oil that began on January 28, 1969, from an offshore oil platform deposited an estimated 4,500 metric tons of pollutant oil on nearly 90 kilometers of California coast by February 8, 1969. Winds, wave action, tides, and substrate determined the pattern of the oil distribution in the intertidal zone. Heavy biological damage occurred in intertidal surf grass and barnacle populations as a result of the oil pollution. Based on earlier surveys, the greatest negative biological change at a sample station was the loss of 16 plant species. However, these losses in species were attributable in most cases to sand movement and other storm-associated events. The potential long-term biological effects of the continuing pollution are discussed. This report consists of the introductory material, two short papers, and general discussions. A treatment of aspects of the Santa Barbara pollution problem that relates the authors observations to those of others, and considers the broader implications of marine pollution in general, has been incorporated in the discussion section. (Author)

PB-197 684
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
BUBBLE COLLAPSE ADJACENT TO A RIGID WALL, A FLEXIBLE WALL, AND A SECOND BUBBLE,
E. E. Timm, and F. G. Hammitt. Jan 71, 4p
UMICH-03371-8-I
Grant NSF-GK-13081

Descriptors: (*Hydrodynamics, Cavitation), (*Bubbles, Collapse), Photographic techniques, Water, Surfaces, Interactions, Boiling, Test equipment.
Identifiers: *Bubble behavior, Rigid surfaces, Flexible surfaces.

The effect of a nearby object on the collapse of an initially spherical bubble is of great interest in the study of bubble behavior in cavitation, boiling, and related fields. The paper presents some preliminary results of a photograpvic nature from thesis work of the first author, presently underway. These results consist of high speed motion picture sequences taken of single bubbles collapsing close to a rigid boundary, a flexible boundary and a second bubble. All are in a beaker containing room temperature tap water. (Author)

PB-197 698
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.

SUMMARY OF FEDERAL REGULATIONS FOR PACKAGING AND TRANSPORTATION OF RADIOACTIVE MATERIALS,
Frank B. Conlon, and George L. Pettigrew. Feb 71, 48p BRH/DMRE 71-1
Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. $0.50 as HE20.1508:P12.

Descriptors: (*Radioactive materials, Transportation), (*Packaging, Regulations), National government, Law (Jurisprudence), Radiation hazards, Rail transportation, Highway transportation, Air transportation.
Identifiers: *Hazardous materials transportation, Federal regulations.

The report summarizes the Federal regulations governing the shipper's and carrier's responsibilities regarding the packaging and transportation of radioactive materials via rail, highway, and air - including information on materials, assembly, and tests of specification containers authorized for packaging. (BRH abstract)

PB-197 715
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
MICROWAVE MEASUREMENTS AND NEW TYPES OF DETECTORS FOR EVALUATION OF HEALTH HAZARDS,
Mays L. Swicord. Jan 71, 45p* BRH/DEP-71-1

Descriptors: (*Radiation hazards, *Public health), (*Radiation measuring instruments, Microwaves), Antennas, Electromagnetic fields, Polarization, Measurement.

The report discusses the technical problems associated with the measurement and detection of microwaves for hazard protection and describes some of the instrumentation which is being used and developed for that purpose. The problems of measurement in the near field and the interpretation of near-field measurements are reviewed, and instrument design parameters necessary for unambiguous measurements are presented. Emphasis is placed upon the antenna size, direction, and polarization sensitivity. A brief discussion of types of detectors and the response of various instruments is included. (Author)

PB-197 793
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
ELECTRONIC X-RAY PULSE COUNTER,
R. Walchle, and G. F. Grove, Jr. Jan 71, 30p* BRH/DEP-71-2

Descriptors: (*Radiation counters, X rays), (*X ray apparatus, Monitors), Pulse counters, Radiation hazards.
Identifiers: *X ray pulse counters.

The paper describes an inexpensive easy-to-build x-ray pulse counter for measuring exposure times of pulsed x-ray machines. Knowledge of the rectification type in the machine and the line frequency allows conversion from number of pulses to exposure time. The instrument will count at rates as low as 2.2 mR per pulse and displays the result on a digital readout. (Author)

PB-197 838
Bureau of Radiological Health, Rockville, Md. Div. of Biological Effects.
RADIATION BIO-EFFECTS.
Summary rept. Jan-Dec 70,
William A. Mills, and Donald M. Hodge. Dec 70, 271p BRH/DBE-70-7

Descriptors: (*Radiation effects, Reviews), (*Public health, Radiation effects), Safety, Standards, Radioactive contaminants, Strontium 90, Fallout, Mortality, Dosimetry, Ultraviolet radiation, Microwaves, Electric equipment, X rays, Therapy, Radium.
Identifiers: Radiological health programs, Electronic product radiation control programs.

The report summarizes the activities of the Division of Biological Effects during 1970. The investigations of the Epidemiologic Studies Branch and the Experimental Studies Branch which comprise the Divison are discussed. Titles of papers that division investigators have prepared for presentation and those appearing in print during the year are listed. (BRH abstract)

PB-197 857
Federal Water Quality Administration, College, Alaska. Alaska Water Lab.
THE CHENA RIVER, THE STUDY OF A SUB-ARCTIC STREAM,
Paul J. Frey, Ernst W. Mueller, and Edward C. Berry. Oct 70, 109p W71-05143, FWQA-1610-10/70

Descriptors: (*Limnology, *Water pollution), (*Rivers, *Water quality), (*Arctic regions, Limnology), Benthos, Plankton, Dissolved gases, Oxygen, Water chemistry, Fisheries, Flood control, Fresh water biology, Aeration, Dams, Sewage, Freezing, Caliform bacteria, Physical properties, Streams, Alaska.
Identifiers: Chena River, Fairbanks (Alaska).

The Chena River is a subarctic stream flowing westerly from the low mountains of eastern Alaska to the Tanana River near Fairbanks. It is typical of many Interior Alaska rivers with the exception that its lower reaches are highly polluted by domestic and industrial wastes from the Fairbanks area. The purpose of this 3-year study of the river was to understand the physical, chemical, and biological limnology of the river system and what effect man's influence--past, present and future--has on the river. A flood control dam is planned for the river above the city of Fairbanks. Significant modification of the water quality and biota of the river can be expected following the construction of the dam. Proper management of the flow from the impoundment can reduce the objectionable effects of this dam on the river system. (Author)

PB-197 863
Garrett Research and Development Co., Inc., La Verne, Calif.
INVESTIGATION OF A HIGH-PRESSURE FOAM WASTE WATER TREATMENT PROCESS.
Water pollution control research series,
James K. P. Miller, and L. Karl Legatski. Apr 70, 39p W71-05156, FWQA-17030-ESX
Paper copy available from SOD, $0.45 as ZZ I67.13/4:17030ESX 04/70.

Descriptors: (*Sewage treatment, *Chemical removal (Sewage treatment)), (*Flotation, Sewage treatment), High pressure tests, Dissolved gases, Air, Organic compounds, Phosphates, Particles, Coagulants, Pilot plants, Cost estimates, Iron chlorides, Equipment.
Identifiers: *Foam fractionation.

The technical and economic feasibility of the separation of organic materials and other contaminants from primary and secondary sewage effluent by a foam fractionation-flotation process was studied. Air-waste water mixtures were held at pressures above 150 psi for from 6 to 25 minutes and then bled to a release vessel where pressures were reduced to atmospheric. Soluble organic and particulate matter collected at the bubble-water interfaces of the fine bubbles being evolved from the supersaturated liquid. Effects of varying flow rate, pressure, contact time, and of different release vessels and additives were studied. 70%, 90%, and 40-80% reductions of COD, phosphates, and suspended solids were effected at optimum conditions of air-to-water volume ratios of 2.17 to 1, pressures greater than 175 psi, and with 300-400 mg/l alum or ferric chloride as coagulants. Estimated costs, exclusive of chemicals were 5 cents/1000 gallons for a 10 mgd plant. (WRSIC abstract)

PB-197 864
FMC Corp., Princeton, N.J.
GRANULAR CARBON TREATMENT OF RAW SEWAGE.
Water pollution control research series,
C. B. Hopkins, W. J. Weber, Jr., and R. Bloom, Jr. May 70, 91p W71-05157, FWQA-17050-DAL-05/70
Paper copy available from SOD: $1.00 as I67.13/4:OPD.17050 DAL 05/70.

Descriptors: (*Activated carbon treatment, *Sewage treatment), (*Clarification, Sewage treatment), Particle size, Chemical removal (Sewage treatment), Coagulants, Iron chlorides, Organic compounds, Phosphates, Pilot plants, Equipment.

A comparison was made of expanded-bed and packed-bed modes of operation of activated carbon adsorption systems in the direct physicochemical treatment of raw sewage and primary effluent. The project involved extended field testing of a pilot scale treatment system of chemical clarification followed by adsorption. The expanded-bed and packed-bed modes of operation demonstrated essentially equivalent removal of organic matter from the chemically clarified effluent. When a 24 ft. settled depth of activated carbon was used, both systems consistently produced a clear, treated water with an average organic content of only 3-5 mg/l, measured either as TOC or BOD. The expanded bed mode offered several advantages: (1) it eliminates plugging or fouling with particulate matter and air binding; (2) feed pressure remains constant and maintenance requirements are minimal; and (3) it provides an opportunity for a degree of natural aeration. Estimated cost for treating raw waste water in a 10 MGD plant by this process is about 20 cents per 1000 gal. with a total estimated investment of $4,000,000. (WRSIC abstract)

PB-197 865
Amicon Corp., Lexington, Mass.
ULTRAFILTRATIVE DEWATERING OF SPENT POWDERED CARBON.
Water pollution control research series,
C. W. Desaulniers, and R. W. Hausslein. Mar 70, 76p W71-05158, FWQA-17020 DBA 03/70
Paper copy available from SOD: $0.70 as I67.12/4:ORD17020DBA03/70.

Descriptors: (*Activated carbon treatment, *Filtration), (*Sewage treatment, Activated carbon treatment), (*Activated carbon, *Dewatering), Membranes, Powder (Particles), Cost estimates, Flocculants, Sedimentation, Slurries, Polyelectrolytes.
Identifiers: Ultrafiltration.

Spent powdered activated carbon from secondary effluent treatment has been successfully dewatered by continuous membrane ultrafiltration. 5 and 10% carbon solids concentration slurries, using a laboratory size thin channel (0.1 sq ft membrane area), have been dewatered by continuous ultrafiltration to solids levels of 25 to 30%. Dewatering rates ranged between 50 and 100 gal/sq ft day at transmembrane pressures of from 10 to 50 psi during runs as long as 9 days, and product water was invariably free of any suspended carbon solids. The cost of membrane ultrafiltration depends upon the membrane life, and at membrane flux rates of 50 gal/sq ft day the cost of dewatering carbon from 10 to 20% solids is $0.0015 per pound of carbon with a membrane life of six months, and $0.0035 per pound with a membrane life of only one month. At the present no conclusive data on membrane life is available, but estimates of between 1 and 6 months are quite common and seen to be reasonable. (WRSIC abstract)

PB-197 872
Bureau of Radiological Health, Rockville, Md. Div. of Biological Effects.

DIAGNOSTIC RADIATION UTILIZATION IN SELECTED SHORT-TERM GENERAL HOSPITALS,
Fay M. Hemphill, Frances B. Locke, and Rudolph D. Hesselgren. Dec 70, 61p BRH/DBE-70-8

Descriptors: (*Radiology, Statistical analysis), (*Radiation hazards, X rays), Radiation effects, Safety, Exposure, Standards, Public health, Digestive system, Respiratory diseases, Musculoskeletal system, Isotopic labeling, Hospitals.
Identifiers: Diagnostic radiation General hospitals, Radiation exposure.

To estimate trends of diagnostic medical radiation, two million patient hospital-stay records were studied annually for 1963, 1966, and 1968 from more than 200 selected general hospitals. The data on the utilization patterns of ten diagnostic radiation categories showed a significant annual increase of discharged patients who received any diagnostic radiation, and increased utilization of multiple categories per discharge. Significant changes were found in utilization of specific radiation categories. Patterns of utilization differed markedly by age, discharge diagnosis, and hospital size. After adjustment for hospital population changes, utilization of any diagnostic radiation showed increases of 1% annually. (Author)

PB-197 888
Resource Engineering Associates, Wilton, Conn.
STATE OF THE ART REVIEW ON SLUDGE INCINERATION PRACTICE.
Water pollution Control Research series,
S. Balakrishnan, D. E. Williamson, and R. W. Okey. Apr 70, 148p W71-05384, FWQA-17070-DIV-04/70
Paper copy available from SOD $1.25 as I67.13/4:17070DIV04/0.

Descriptors: (*Sludge disposal, *Incinerators), (*Sewage treatment, Sludge disposal), Reviews, Cost estimates, Concentrating, Dewatering, Filtration, Compacting, Fuels, Furnaces, Fluidized bed processors, Oxidation, Air pollution, Hearths.
Identifiers: *Solid waste disposal.

The current status of the incineration art and the associated costs are presented. Principal emphasis is placed upon sludge thickening, sludge conditioning, sludge dewatering, sludge incineration systems, and the design and operation of incinerators. The attitudes of state agencies and consulting engineering firms towards the design and operation of incinerators is included. Conclusions reached are: (1) on-site disposal in limited space requires developments far more efficient in disposing of solids; (2) much improvement in pretreatment steps is essential; (3) addition of other combustible materials may enhance the efficiency of combustion of sludge; and (4) although several systems are currently available there is great need for investigation and updating of the process methods. (WRSIC abstract)

PB-197 889
Rocketdyne, Canoga Park, Calif.
ELECTROOSMOTIC PUMPING FOR DEWATERING SEWAGE SLUDGE.
Water pollution control research series,
Jerome Greyson. Jul 70, 70p W71-05385, FWQA-17070-EHE-07/70
Contract FWQA-14-12-568
Paper copy available from SOD $0.55 as I67.13/4:ORD-17070-EHE-07/70.

Descriptors: (*Sludge disposal, *Dewatering), (*Sewage treatment, Sludge disposal), (*Electroosmosis, Sludge disposal), Pumps, Membranes, Electrodes, Cost estimates, Zeta potential, Surfactants, Water flow.

An experimental program was conducted to determine equipment configurations for efficient solids removal, identification of critical parameters involved in the efficiency of electroosmotic pumping, and the design and testing of two prototype electroosmotic pumps. It was determined that electroosmosis can be applied to dewatering waste sludges of various types. For efficient dewatering from very wet sludge (2%) to burnable solids, it is necessary to orient the pumping apparatus with a cathode screen beneath the anode so that an initial sludge film can be formed by gravity settling at the cathode surface. Sludge cannot be thickened to a solids level exceeding 20% if the cake is beneath the liquid level of the sludge suspension and for drying beyond the 20% value, the cake must be brought out of the liquid. (WRSIC abstract)

PB-197 890
Infilco, Tucson, Ariz.
ADVANCED WASTE WATER TREATMENT USING POWDERED ACTIVATED CARBON IN RECIRCULATING SLURRY CONTACTOR-CLARIFIERS.
Water pollution control research series,
C. F. Garland, and R. L. Beebe. Jul 70, 89p W71-05386, FWQA-17020-FKB-07/70
Contract FWQA-14-12-400
Paper copy available from SOD $0.75 as I67.13/4:ORD-17020-FKB-07/70.

Descriptors: (*Sewage treatment, *Activated carbon treatment), Polyelectrolytes, Activated carbon, Flocculants, Cost estimates, Water flow, Adsorption, Powders, Contactors, Slurries, Pilot plants, Field tests.

Pilot-scale studies dealing with the use of recirculating-slurry solids-contact clarifiers in treating activated sludge plant effluent were studied. Evaluation of all available materials led to selection of Darco S-51 activated powdered carbon and Purifloc C-32 polyelectrolyte flocculating agent, with 6 to 7 mg/l of polyelectrolyte required at a carbon feed rate of up to 140 mg/l. 30% greater carbon efficiency, as opposed to a single stage conventional unit, was achieved with a single slurry unit, while results for two series clarifiers were comparable to that of two conventional counter-current adsorption systems requiring multiple agitated tanks, clarifiers, and filters. Estimated costs for a 10 mgd plant with 240 mg/l and 8 mg/l dosages of carbon and polyelectrolytes respectively are $0.15/1000 gal for a 10 mgd plant, and $0.12.7/1000 gal for a 100 mgd plant. Further cost reductions could be possible in the event that effluent quality restrictions would allow a decrease in the carbon dosages. (WRSIC abstract)

PB-197 891
General American Transportation Corp., Niles, Ill.
MATHEMATICAL MODEL OF RECALCINATION OF LIME SLUDGE WITH FLUIDIZED BED REACTORS.
Water pollution control research series,
G. J. Ducar, and P. Levin. Sep 70, 57p W71-05387, FWQA-17090-EHQ-09/70
Contract FWQA-14-12-415
Paper copy available from SOD $0.55 as I67.13/4:ORD-17090-EHQ-09/70.

Descriptors: (*Calcium oxides, *Regeneration (Engineering)), (*Calcium carbonate, *Roasting), (*Fluidized bed processors, *Sludge disposal), (*Sewage treatment, Sludge disposal), Water treatment, Computer programming, Economic analysis, Operating costs, Mathematical models.

A computer program, based on data collected from a literature review and from actual plant operation of pulp mills and a water softening plant, has been developed to evaluate lime sludge recalcination operations. Since fluidized bed reactor have not yet been installed commercially, no data was available. The models developed represent the recalcination process as applied to tertiary treatment plants. This program was designed for use as a subroutine in the executive program, 'Preliminary Design of Waste water Treatment Systems,' which is used to optimize and evaluate new waste water treatment systems to be funded by the FWQA. (Author)

PB-197 892
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
THE DEVELOPMENT OF A FLUIDIZED-BED TECHNIQUE FOR THE REGENERATION OF POWDERED ACTIVATED CARBON.
Water pollution control research series,
A. K. Reed, T. L. Tewksbury, E. A. Wasto, J. G. Price, and G. R. Smithson, Jr. Mar 70, 53p* W71-05388, FWQA-17020-FBD-03/70
Contract FWQA-14-12-113
Paper copy available from SOD $0.55 as I67.13/4:ORD-17020-FBD-03/70.

Descriptors: (*Activated carbon, *Regeneration (Engineering)), (*Fluidized bed processors, Activated carbon), Activated carbon treatment, Pilot plants, Economic analysis, Adsorption, Field tests.

Results of research conducted on the regeneration of spent powdered carbon is described. The study was directed toward the development of a fluidized-bed regeneration technique in which two systems were investigated. One was a system in which the dried spent carbon was regenerated during its passage through a fluidized-bed of inert material while the other system consisted of a pulsating fluidized-bed system in which the finely divided regenerated carbon served as the bed material. Although both systems restored the spent powdered carbon to 90% of its original adsorptive capacity and recovered 80% by weight, the fluidized inert bed was chosen for larger scale development because of its higher unit capacity. A pilot-scale unit was designed and constructed to process 30 pounds of spent carbon in an 8 hour period. The results indicated that regenerated carbon was as effective as virgin carbon for organic removal for at least 3.6 cycles through the system. As economic analysis indicated that operating costs would be about 1 cent per pound for a commercial plant producing 20,000 pounds of regenerated carbon per day. (WRSIC abstract)

PB-197 931
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Management Office.
SATELLITE VEHICLE SYSTEMS FOR SOLID WASTE COLLECTION, EVALUATION AND APPLICATION,
Ronald A. Perkins. 1971, 253p* EPA-SW-8ZTS-71

Descriptors: (*Refuse disposal, *Trucks), (*Urban planning, *Garbage disposal), Cost analysis, Collection, Mathematical models, Field tests, Georgia, South Carolina, Tennessee, Oregon, California, Wisconsin.
Identifiers: *Solid waste disposal, Atlanta (Georgia), Columbia (South Carolina), Knoxville (Tennessee), Medford (Oregon), Pasadena (California), Waukesha County (Wisconsin).

The productive efficiency and costs associated with residential satellite vehicle collection systems are quantitatively evaluated and compared with conventional collection systems for collecting residential solid waste. Those factors that affect efficiency and economy were quantitatively analyzed to develop models that can predict collection cost and crew efficiency with a high degree of accuracy and provide a practical and reliable basis for designing future collection systems using satellite vehicles. Four makes of satellite vehicles (Cushman, Trashmobile, Westcoaster, and Trash Taxi) operating in six communities with diverse terrain, type of collection agency, and collection frequency were chosen for the study. These small three- or four-wheeled vehicles transport wastes from the dwelling unit storage point to a packer truck for ultimate transfer to a disposal site. The vehicles reportedly work best in areas with single-family homes where housing density is medium to low. The costs, which could not be compared because they occurred under distinctively different conditions, are measured as 'annual cost per dwelling' rather than as 'cost per ton.' (Author)

PB-198 033
IIT Research Inst., Chicago, Ill.
DEVELOPMENT OF PARTICULATE EMISSIONS CONTROL TECHNIQUES FOR SPARK IGNITION ENGINES.
Final rept. Jun 69-Nov 70,
Sudesh K. Sood, and Richard Karuhn. Feb 71,
98p* IITRI-C6186-5
Contract CPA-22-69-134

Descriptors: (*Air pollution, *Exhaust gases), (*Particles, Air pollution control equipment), (*Spark ignition engines, Air pollution), (*Lead inorganic compounds, Air pollution), (*Exhaust systems, *Air pollution control equipment), Antiknock additives, Lead halides, Column packings, Carbon, Fluidized bed processors, Ultrasonic radiation, Gas filters, Agglomeration, Gas flow.
Identifiers: *Automobile exhaust.

The report describes the experimental results of two techniques for the removal of particulate contaminants from spark ignition engine exhausts. The first technique was based on the thermal deposition of lead aerosol particles in the size range 0.1 - 0.8 microns in a packed bed. The effect of gas-packing temperature differential, packing material, packing shape and size, contamination buildup, and gas velocity on collection efficiency of the bed was studied. Experimental results show that collection efficiency of the packed bed device depends primarily on the gas-packing temperature differential. The second technique was based on the use of sonic waves to increase the collisions between the aerosol particles and the relatively coarse particles of a fluidized bed, and hence increase the collection efficiency. The effect of sound frequency, gas velocity, and power input to the sound driver units was studied. Experimental results showed that there was no significant effect of sound frequency, in the range 250-2700 HZ, on collection efficiency of the fluidized bed. (Author)

PB-198 052
Eastern Environmental Radiation Lab., Montgomery, Ala.
DEVELOPMENT OF ION EXCHANGE PROCESSES FOR THE REMOVAL OF RADIONUCLIDES FROM MILK.
Final rept.,
D. G. Easterly, I. B. Brooks, J. K. Hasuike, and Charles L. Weaver. Jan 71, 45p RO/EERL-71-1
Paper copy available from SOD as EP6.10.71-1 $0.50.

Descriptors: (*Radioactive contaminants, Milk), (*Milk, *Ion exchanging), (*Food processing, Milk), Cesium 134, Iodine 131, Strontium 85, Pilot plants, Fallout.

Work has been conducted on the r[illegible]al of radionuclides from milk by ion exchar[illegible]m the late fifties to June 1969. This has prog[illegible]ed from laboratory-scale to a full-scale commercial process where the system was demonstrated to be feasible using fixed-bed ion exchange columns. For three full-scale combined anion-cation runs, an average of 99.3 percent of iodine-131 and 94.6 percent of strontium-85 was removed. This process resulted in an increase in the total solids, ash, potassium, and citrate ions. The taste of the treated milk compared favorably with untreated milk, although some decrease in flavor score was noted. Good radionuclide removal was obtained using the pilot plant moving-bed system. These studies, although not extensive, showed 89, 99, and 99.5 percent removal for strontium, iodine, and cesium, respectively. The limited investigations of cesium removal showed this system to have much greater potential than the fixed-bed system. (Author)

PB-198 061
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME I. ATMOSPHERIC AND METEOROLOGICAL ASPECTS OF AIR POLLUTION,
M. Y. Nuttonson. Dec 69, 126p* APTD-0635
Grant PHS-AP-00786-01
See also Volume 2, PB-198 062.

Descriptors: (*Air pollution, *Atmospheric motion), (*Meteorological data, Air pollution), (*Temperature inversions, Air pollution), (*USSR, Air pollution), Atmospheric diffusion, Urban areas, Fog, Turbulence, Transport properties, Wind (Meteorology), Climatology, Translations.
Identifiers: *Moscow (USSR).

Contents:
- Chief problems of atmospheric diffusion and air pollution;
- The structure of an airstream as a factor in the transport of products of atmospheric pollution;
- Analysis of aerological conditions of atmospheric pollution in certain regions of the European territory of the USSR;
- Some characteristics of the propagation of noxious pollutants from high sources as a function of synoptic-meteorological factors;
- Some results of synoptic-climatological analysis of air pollution in cities;
- The theory of atmospheric diffusion under fog conditions;
- Geographic distribution of the turbulence coefficient in the lowest atmospheric layer in daytime in summer;
- Inversions of lower troposphere and their influence on the air pollution of the city of Moscow;
- Results of experimental studies of atmospheric pollution in the region of an electric power plant;
- The settling of an aerosol introduced into the atmosphere in the form of a vertical turbulent current;
- AND Calculation of dispersal of precipitating contaminant from a linear source in the boundary layer of the atmosphere.

PB-198 062
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME II. EFFECTS AND SYMPTOMS OF AIR POLLUTES ON VEGETATION, RESISTANCE AND SUSCEPTIBILITY OF DIFFERENT PLANT SPECIES IN VARIOUS HABITATS, IN RELATION TO PLANT UTILIZATION FOR SHELTER BELTS AND AS BIOLOGICAL INDICATORS,
M. Y. Nuttonson. Dec 69, 108p* APTD-0636
Grant PHS-AP-00786-01
See also Vol 1, PB-198 061 and Volume 3, PB-198 063.

Descriptors: (*Air pollution, *Plants (Botany)), (*USSR, Air pollution), Industrial wastes, Combustion products, Exhaust gases, Grasses, Trees (Plants), Plant physiology, Planting, Translations, Pine trees.
Identifiers: *Air pollution effects (Plants).

Contents:
- Purification of atmospheric air of contaminants from industrial discharges;
- Industrial wastes of the cities of Baku and Sumgait and their effect on green plantings;
- Growth and development of ornamental herbaceous plants in coke-chemical works;
- The effect of industrial gas on the growth of trees and shrubs;
- Effect of industrial pollutants on the vegetation of Bashkir;
- Measures to eliminate atmospheric pollution from 'vtortsvetmet' mills;
- Effect of plantings on the sanitary and hygienic conditions of densely populated settlements;
- Recommended procedures for planting sanitary-protective green belts in areas of industrial enterprises;
- Smoke resistance of woody plants as an ecological problem;
- Study of physiological indices of trees and shrubs in relation to gas and smoke resistance;
- Moisture conditions and gas resistance of woody plants;
- The gas resistance of local and introduced arboreal plants under the conditions existing in Sverdlovsk Oblast';
- Assortments of gas-resistant lawn grasses;
- Resistance of some grasses to fluorine;
- Making a city verdant;
- Urgent questions concerning verdant plantings in the city of Baku;
- An experiment in creating protective plantings in the city of Krasnoural'sk;
- Trees and shrubs for making the Donets coal basin verdant;
- AND Combining protective and ornamental characteristics of woody plants.

PB-198 063
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME III. THE SUSCEPTIBILITY OR RESISTANCE TO GAS AND SMOKE OF VARIOUS ARBOREAL SPECIES GROWN UNDER DIVERSE ENVIRONMENTAL CONDITIONS IN A NUMBER OF INDUSTRIAL REGIONS OF THE SOVIET UNION,
M. Y. Nuttonson. Dec 69, 126p* APTD-0637
Grant PHS-AP-00786-01
See also Volume 2, PB-198 062, and Volume 4, PB-198 064.

Descriptors: (*Air pollution, *Plants (Botany)), (*USSR, Air pollution), Industrial wastes, Combustion products, Exhaust gases, Sulfur dioxide, Nitrogen oxides, Particles, Pine trees, Plant physiology, Translations.
Identifiers: *Air pollution effects (Plants).

Contents:
- The effect of industrial gases and industrial smoke on various forest species;
- The influence of smoke and gas on the flowering and fruiting of some trees and shrubs;
- The effect of specific industrial gases on the growth of some tree species;
- Reaction of trees and shrubbery to air pollution in the forest-park belt of Moscow and measures for extending the lifespan of plants;
- Current conditions and scientific problems in studying the injurious effects of industrial pollutants on plants and in developing methods for controlling them in the Urals;
- The drainage of temporarily swamped soils in relation to pine plantings growing under conditions of industrial air pollution;
- The effect of industrial smokes and gases upon coniferous forests growing under conditions of increased humidity in the Moscow region (Podmoskov'E);
- Some peculiarities of the susceptibility of scotch pine sprouts to sulfur dioxide injury;
- Gas resistance of pine and birch;
- The effect of sulfur dioxide on woody plants under the environmental conditions prevailing in the Sverdlovsk region;
- Characteristics of photosynthesis and of some other processes in connection with smoke and gas resistance of trees and shrubs;
- Indicators of gas resistance of arboreal plants;
- The activity of certain enzymes and gas resistance of woody plants;
- Variation in the oxidizability of the cell content as one of the indicators of gas resistance in plants;
- AND Effect of sulfur dioxide on the enzymatic activity of tree leaves.

PB-198 064
American Inst. of Crop Ecology, Silver Spring, Md.

AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME IV. METEOROLOGICAL AND CHEMICAL ASPECTS OF AIR POLLUTION, PROPAGATION AND DISPERSAL OF AIR POLLUTANTS IN A NUMBER OF AREAS IN THE SOVIET UNION,
M. Y. Nuttonson. Dec 69, 116p* APTD-0638
Grant PHS-AP-00786-01
See also Volume 3, PB-198 063.

Descriptors: (*Air pollution, *Atmospheric motion), (*Urban areas, Air pollution), (*Meteorological data, Air pollution), (*USSR, Air pollution), Industrial wastes, Sulfur dioxide, Nitrogen oxides, Combustion products, Particles, Atmospheric diffusion, Concentration (Composition), Atmospheric precipitation, Coulometers, Translations.

Contents:
- Meteorological conditions in relation to the formation of periods of heavy air pollution in cities;
- Atmospheric diffusion of impurities during a calm;
- Patterns of variation of the temperature gradient in the ground layer of air on the territory of the USSR;
- Expeditionary study of the pollution of the air reservoir of industrial cities;
- Organization of experiments for studying the propagation of noxious impurities from large sources;
- Determination of the air pollution potential;
- Some generalized conclusions concerning the experience of observation posts in reference to the chemical composition of the atmosphere of cities;
- Distribution and chemical composition of natural aerosols over various regions of the European territory of the USSR;
- Chemical composition of cloud water in regions of Western Siberia;
- AND Coulometric method of determination of sulfur-containing compounds in air.

PB-198 065
Research Triangle Inst., Durham, N.C.
CHEMILUMINESCENT OZONE METER FOR CONTINUOUS AIR MONITORING PROJECT. INSTRUCTION MANUAL.
Final rept.,
J. B. Tommerdahl, R. B. Strong, and A. H. Truckner. Jan 71, 85p* APTD-0634
Contract PHS-CPA-70-27
See also rept. no. PB-194 118.

Descriptors: (*Ozone, *Monitors), (*Gas detectors, Ozone), Chemiluminescence, Manuals, Engineering drawings, Wiring diagrams, Maintenance.
Identifiers: *Air pollution detection.

The report describes the results of a program to design, construct, calibrate and field test an Ozone-specific instrument using a chemiluminescent principle. The document is also an instruction manual, with two separate attachments included; a set of engineering drawings for the machine shop fabricated parts and a subsystem manual comprised of instruction sheets and manuals for the individual commercially procured units. (Author)

PB-198 066
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
THE FEDERAL R AND D PLAN FOR AIR-POLLUTION CONTROL BY COMBUSTION-PROCESS MODIFICATION.
Final rept.

11 Jan 71, 352p* APTD-0643
Contract PHS-CPA-22-69-147

Descriptors: (*Air pollution, *Research management), (*Combustion, Research management), (*Combustion products, Air pollution), Fuels, Government policies, Exhaust gases, Forecasting, Gas turbine engines, External combustion engines, Internal combustion engines, Spark ignition engines, Particles, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Sulfur dioxide, Furnaces, Electric power generation, Coal, Natural gas, Fuel oil, Industrial wastes, Cost estimates.
Identifiers: *Air pollution control.

The report presents the results of a study conducted for the Air Pollution Control Office to (1) identify gaps in combustion technology and (2) recommend a 5-year plan with priorities for effectively allocating resources for APCO-supported combustion R and D directed toward meeting projected needs for air pollution control of energy-conversion system by combustion modification. Combustion applications considered as elements of the plan include: central-station power generation; industrial processing; industrial steam generation, commercial and residential heating; gas turbines and external-combustion engines; and reciprocating internal-combustion engines. A 5-year plan of combustion R and D is presented, with R and D opportunities identified and ranked in five priority levels. The plan includes the description of 49 applied R and D opportunities in specific combustion application areas and 27 research opportunities of a more fundamental and broadly applicable nature. Applied R and D opportunities were ranked by a priority rationale. (APCO abstract)

PB-198 067
Environmental Protection Agency. Research Triangle Park, N.C. Air pollution Control Office.
BERYLLIUM AND AIR POLLUTION: AN ANNOTATED BIBLIOGRAPHY.

Feb 71, 74p* AP-83
Paper copy available from SOD $0.40 as EP4.9:83.

Descriptors: (*Air pollution, *Beryllium), (*Bibliographies, Beryllium), (*Beryllosis, Bibliographies), Detection, Control, Standards, Occupational diseases, Respiratory diseases, Industrial wastes, Toxicology, Atmospheric motion, Solid rocket propellants, Cancer.
Identifiers: *Air pollution detection, *Air pollution control, *Air pollution effects (Animals), *Air pollution effects (Plants).

The annotated bibliography, containing 107 abstracts of documents and articles on beryllium, is divided into the following categories: emission sources, atmospheric interaction, measurement methods, control methods, effects-human health, standards and criteria and basic science and technologies. (APCO abstract)

PB-198 072
IIT Research Inst., Chicago, Ill.
CHEMICAL SPECIES IN ENGINE EXHAUST AND THEIR CONTRIBUTIONS TO EXHAUST ODOR.
Final rept. 1969-70,
Andrew Dravnieks, and Anne O'Donnell. Nov 70, 99p* IITRI-C6183-5 EPA-CPA-22-69-98
Contract PHS-CPA-22-69-98

Descriptors: (*Exhaust gases, *Odors), (*Air pollution, Exhaust gases), Diesel engines, Gas chromatography, Mass spectroscopy, Aldehydes, Alkenes, Aromatic polycyclic hydrocarbons, Ketones, Smell, Evaluation.
Identifiers: *Diesel engine exhaust, Indans.

The project investigated the chemical composition of the odorants in diesel engine exhaust. Exhaust samples were collected in fluidized or packed bed collectors filled with gas chromatographic packings. Separation of the individual compounds was accomplished by two gas chromatograph columns in series. Final identification of the separated compounds was accomplished by mass spectrometry. About 100 compounds were judged to be odor relevant in diesel engine exhaust by this procedure. (APCO abstract)

PB-198 074
Babcock and Wilcox Co., Alliance, Ohio. Research Center.
MAGNESIA BASE WET SCRUBBING OF PULVERIZED COAL GENERATED FLUE GAS - PILOT DEMONSTRATION,
W. Downs, and A. J. Kubasco. 28 Sep 70, 139p*
BW-5153 APTD-0648
Contract CPA-22-69-162
See also Addendum, PB-198 075.

Descriptors: (*Air pollution, Combustion products), (*Air pollution control equipment, *Scrubbers), (*Adsorption, *Sulfur dioxide), (*Adsorbents, *Magnesium carbonates), (*Particles, Air pollution control equipment), (*Nitrogen oxides, Adsorption), Fly ash, Sulfates, Electric power plants, Coal, Flue gas, Pulverized fuels, Magnesium oxides, Pilot plants, Furnaces.
Identifiers: *Air pollution control, *Waste gas recovery, Magnesia base scrubbers.

A project was conducted to demonstrate the adequacy of magnesia base wet scrubbing to remove essentially all of the particulates and most of the sulfur dioxide from pulverized coal furnaces. Side effects such as sulfate formation, NO (x) absorption, and scrubber operability were to be determined. A wet scrubbing pilot plant which consisted of a venturi-type particulate scrubber, a venturi-type absorber, and a tray-type absorber was designed and constructed. Over 100 short term tests were performed to determine the most satisfactory operating conditions for each scrubber. The results indicate that the magnesia base wet scrubbing process is superior to other wet processes known to be under development for abatement of both particulates and SO2 from coal-fired furnaces. (Author)

PB-198 075
Babcock and Wilcox Co., Alliance, Ohio. Research Center.
MAGNESIA BASE WET SCRUBBING OF PULVERIZED COAL GENERATED FLUE GAS - PILOT DEMONSTRATION,
W. Downs, and A. J. Kubasco. 15 Dec 70, 658p*
BW-5153-Add APTD-0649
Contract CPA-22-69-162
Addendum to Rept. no. BW-5153, PB-198 074.

Descriptors: (*Air pollution, Combustion products), (*Air pollution control equipment, *Scrubbers), (*Adsorption, *Sulfur dioxide), (*Absorbents, *Magnesium carbonates), (*Particles, Air pollution control equipment), Data, Computer programs, Magnesium oxides, Coal, Pulverized fuels, Nitrogen oxides, Flue gas, Pilot plants, Furnaces.
Identifiers: *Air pollution control, *Waste gas recovery, Magnesia base scrubbers.

The addenum presents a complete record of the data obtained from a project which was conducted using a wet scrubbing pilot plant, to demonstrate the adequacy of magnesia base wet scrubbing to remove essentially all of the particulates and most of the SO2. The computer program, all the computer printout, and summaries there-of are included. (Author)

PB-198 078
Bureau of Radiological Health, Rockville, Md. Div. of Biological Effects.
RADIATION INCIDENTS REGISTRY REPORT 1970,
Loren F. Mills, and Phyllis Segal. Dec 70, 57p
BRH/DBE-70-6

Descriptors: (*Radiobiology, *Indexes (Documentation)), Radiation effects, Radiation injuries, Public health, Electromagnetic radiation, Ionizing radiation, Ultraviolet radiation, Ultrasonic radiation, Exposure, X rays, Lasers, Microwaves, Electronics industry, Irradiation, Populations.
Identifiers: *Radiation Incidents Registry.

The Radiation Incidents Registry established by the Bureau of Radiological Health has, after one year of operation, provided data on 209 reported incidents and reported potential incidents resulting from exposure to ionizing and nonionizing radiation and ultrasonic waves. These incidents include potential and overt biological injuries to 276 individuals. (Author)

PB-196 079
Michigan Univ., Ann Arbor. Dept. of Mechanical Engineering.
KINETICS OF OXIDATION AND QUENCHING OF COMBUSTIBLES IN EXHAUST SYSTEMS OF GASOLINE ENGINES.
Final rept. 24 Feb 69-23 Feb 70,
Donald J. Patterson, B. Carnahan, R. H. Kadlec, H. A. Lord, and J. J. Martin. Dec 70, 92p
EPA-CPA-22-69-51-HEW
Contract PHS-CPA-22-69-51-HEW

Descriptors: (*Air pollution, *Exhaust gases), (*Air pollution control equipment, *Spark ignition engines), (*Exhaust systems, *Chemical reactors), Combustion, Reaction kinetics, Oxidation, Mixing, Spectroscopic analysis, Carbon dioxide, Carbon monoxide, Nitrogen oxides, Hydrocarbons, Gas flow.
Identifiers: *Thermal reactors (Chemical), *Automobile exhausts.

The project investigated reaction kinetics and physical processes including mixing in thermal reactor systems. Baseline data of various species were collected on an engine for various engine operating conditions. The results are not complete on work to obtain information on concentrations of chemical species in the reactor which will aid in better reactor design. A computer model of reactions occurring in the reactor is being constructed.

PB-196 080
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
EVALUATION OF THE PICKER CAPACITOR DISCHARGE MOBILE X-RAY MACHINE,
G. F. Grove, Jr., and E. A. Miller. Feb 71, 36p
BRH/DEP-71-3

Descriptors: (*X ray apparatus, *Radiation hazards), (*Safety engineering, X ray apparatus), X ray tubes, Spurious radiation, Mobile equipment.

Tests were performed on a Picker Model DGC-1010 capacitor discharge mobile x-ray machine to determine accuracy of voltage and current-time indications, line voltage effects and current drain, exposure reproducibility, focal spot size and location, correspondence between the collimator and light localizer, inherent filtration, half-value layer, radiation output, and tube housing and collimator leakage. Spurious radiation was found to originiate in the tube under certain conditions. These conditions were investigated, and the observed radiation levels are reported. To determine beam quality differences between capacitor discharge and conventional equipment, comparisons were made of half-value layer and step-wedge and phantom radiographs. (Author)

PB-196 087
Michigan Univ., Ann Arbor. Great Lakes Research Div.
PLANKTON DIATOM ASSEMBLAGES IN LAKE MICHIGAN.
Water pollution control research series,
E. F. Stoermer, and J. J. Yang. Dec 69, 273p W71-05984, FWQA-18050-DKE-12/69
Paper copy available from SOD $2.00 as I67.13/4:18050DKC12/9.

Descriptors: (*Diatoms, *Lakes), (*Water pollution, *Plankton), Plants (Botany), Growth, Seasonal variations, Taxonomy, Populations, Water quality, Ecology, Food chains, Michigan.
Identifiers: *Lake Michigan.

The various elements of Lake Michigan plankton diatom flora, their seasonal cycles, and history of changes were determined and genera and species are listed. Absolute frequency, relative frequency, and contribution to diversity of each taxon were computerized. Occurrence of the different entities were recorded: those associated with certain water quality conditions; constituents of only extremely oligotrophic floras, rapidly replaced in disturbed portions of the lake; those more tolerant of changing conditions but rapidly reduced in abundance with extensive chemically measurable changes; other entities seemingly favored by slight increases in trophic level, flourishing in moderately disturbed portions of the lake, but declining when pollution increases; those formerly able to thrive only in naturally eutrophic estuaries and inshore areas, favored by increasing pollution and now flourishing in highly disturbed open lake areas; the final general group of dominant plankton species including those taxa, apparently not able to live in the original conditions of Lake Michigan but introduced following pollution. All of the plankton diatoms associated with extreme water quality degradation in the Great Lakes system are now present in Lake Michigan, indicating critical pollution levels. (WRSIC abstract)

PB-196 091
Zoological Society of San Diego, Calif. Health Dept.
EFFECTS OF OIL POLLUTION ON WATERFOWL; A STUDY OF SALVAGE METHODS.
Water Pollution Control Research series,
Lynn A. Griner, and Robert Herdman. Dec 70, 44p W71-05983, EPA-WQO-15080-EBZ-12/70
Paper copy available from SOD $0.50 as I67.13/4:15080EBZ.12

Descriptors: (*Water pollution, *Oils), (*Birds, Cleaning), California, Ducks, Geese, Toxicity, Cleaning, Cleaning agents, Feathers, Films, Crude oil, Petroleum industry, Pathology.
Identifiers: *Water pollution effects (Animals), Oil slicks, Santa Barbara (California), *Oil pollution.

A study was made of salvage methods for waterfowl subjected to oil pollution. Mallard ducks were the primary test species used. Aspects of the pathology of some of the waterfowl species involved in the Santa Barbara oil slicks were also investigated. Although some refined petroleum products contain toxic compounds, the Santa Barbara crude used as a test oil in this study produced no apparent ill effects. Polycomplex A-II was found to be a rapid and effective cleansing agent for the removal of oil from bird plumage. Oil on bird plumage alters feather structures by replacing the small air pockets twee fn barbules of the feather, thereby decreasing buoyancy and insulation. Removal of oil from downfeathers is more difficult than from the contour feathers. Ducks and geese are more amenable to treatment and post-treatment care than are the more aquatic fowls, such as grebes, loons, auks and murres. Confinement times should be as brief as possible, as the incidence of mycotic and other infectious diseases increases under long periods of close confinement. (Author)

PB-196 092
Gulf General Atomic, Inc., San Diego, Calif.
STUDY AND EXPERIMENTS IN WASTE WATER RECLAMATION BY REVERSE OSMOSIS.
Water pollution control research series,
I. Nusbaum, J. H. Sleigh, Jr., and S. S. Kremen. May 70, 121p W71-06025, FWQA-17040-05/70
Contract FWQA-14-12-181
Paper copy available from SOD $1.25 as I67.13/4:17040.05/10.

Descriptors: (*Water reclamation, *Osmosis), (*Demineralizing, Osmosis), (*Water pollution, Osmosis), (*Sewage treatment, Osmosis), Desalting, Industrial waste treatment, Water quality, Activated sludge process, Activated carbon treatment, Chlorination, Cleaning, Detergents, Field tests.
Identifiers: Reverse osmosis.

Current reverse osmosis technology was applied to the treatment and demineralization of secondary effluents to determine what operational problems may occur, and develop methods of alleviating them. Two parallel reverse osmosis systems, with 50 sq ft. spiral-wound reverse osmosis modules, were operated and results for activated sludge effluent versus activated carbon treated activated sludge effluent were compared. Fouling problems were encountered for which previously developed cleaning techniques were ineffective. An enzyme-based detergent technique was developed which alleviated the problem and restored performance. The size of the brine spacers affected only the pressure drop across the modules, and not the overall performance. Also the quantity of water handled would, over a 3 year period, be substantially more than could be handled by standard flux-high selectivity membranes. (WRSIC abstract)

PB-196 093
Minicars, Inc., Goleta, Calif.
EMISSION OPTIMIZATION OF HEAT ENGINE/ELECTRIC VEHICLE.
Final rept. May 70-Feb 71,
Jerar Andon, and I. R. Barpal. 28 Jan 71, 98p*
EHS-70-107

Descriptors: (*Air pollution, *Exhaust gases), (*Electric automobiles, Air pollution), (*Spark ignition engines, Exhaust gases), Hydrocarbons, Nitrogen oxides, Carbon monoxide, Acceleration (Physics), Tests.
Identifiers: *Hybrid vehicular propulsion.

The basic purpose of the study was to determine the relative reduction in exhaust emissions obtainable from a heat engine/electric hybrid vehicle when compared to the same vehicle powered by a heat engine alone. Emission measurements were made of the hybrid vehicle in its original design state as well as emission measurements of a modified and improved hybrid design. The emission evaluations were made with the vehicle in three design phases. The tests for the three hybrid designs indicated a marked reduction of exhaust emissions with the delayed throttle control and increased electrical power. The heated manifold allowed leaner air/fuel mixtures to be used and resulted in lower exhaust emissions. The best emission reductions were approximately 60% reduction in hydrocarbons and carbon monoxide and 25% reduction in nitrogen oxides when comparing the baseline heat engine with hybrid power trains. The comparisons hold for both concentration and total mass-type measurements with the vehicle on the California 7-Mode Driving Cycle. (Author)

PB-196 096
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
ATMOSPHERIC EMISSIONS FROM PETROLEUM REFINERIES. A GUIDE FOR MEASUREMENT AND CONTROL.
Environmental health series; Air pollution.

1960, 64P PHS-Pub-763 APTD-0647

Descriptors: (*Air pollution, *Hydrocarbons), (*Refineries, Air pollution), (*Petroleum refining, Air pollution), Industrial wastes, Evaporation control, Control, Sulfur oxides, Combustion products, Particles, Cracking process, Distillation.
Identifiers: *Air pollution control.

In September 1955 a study, known as the 'Joint Project', was started to determine the quantity and nature of emissions from oil refineries located in Los Angeles County. The manual supplements the Joint Project reports and stresses the use which can be made of the methodology and results of the Joint Project in estimating emissions from refineries. It also includes a discussion of equipment and processes, and details on the sources, magnitude

of emissions, and methods of control in effect in Los Angeles County refineries. (Author)

PB-198 125
Robert S. Kerr Water Research Center, Ada, Okla. Treatment and Control Research Program.
WATER QUALITY MANAGEMENT PROBLEMS IN ARID REGIONS.
Water pollution control research series,
James P. Law, Jr., and Jack L. Witherow. Oct 70, 109p* W71-06111, FWQA-13030-DYY-06/69

Descriptors: (*Arid land, *Water pollution), (*Nitrates, Water pollution), (*Sewage treatment, *Water reclamation), (*Agricultural wastes, Water poliution), (*Irrigation, Water pollution), Denitration, Algae, Salinity, Desalting, Water quality, Industrial wastes, Ground water, Chemical removal (Water treatment).

An international conference entitled 'Arid Lands in a Changing World' sponsored by the American Association for the Advancement of Science Committee on Arid Lands and the University of Arizona, was held at Tucson in June, 1969. The report presents a selected group of the papers presented at those sessions which should benefit those concerned with water quality management problems in arid regions. The title of the papers included in this report are as follows: Nitrate removal from agricultural wastewater; the effects of salinity standards on irrigated agriculture in the Colorado River basin; Problems of pollution of irrigation waters in arid regions; Water quality requirements and re-use of wastewater effluents; Salinity control in return flow from irrigated areas--a demonstration project; Water quality control problems in inland sinks; Natural pollution in arid land waters; Distillation of wastewaters: A water resource for arid regions; and Animal waste runoff--a major water quality challenge. (WRSIC abstract)

PB-198 137
Industrial Gas Cleaning Inst., Inc., Rye, N.Y.
STUDY OF TECHNICAL AND COST INFORMATION FOR GAS CLEANING EQUIPMENT IN THE LIME AND SECONDARY NON-FERROUS METALLURGICAL INDUSTRIES.
Final rept.,
L. C. Hardison, and H. R. Herington. 31 Dec 70, 307p* APTD-0642
Contract PHS-CPA-70-150

Descriptors: (*Air pollution control equipment, *Smelting), (*Furnaces, Air pollution control equipment), (*Industrial wastes, *Air polltuion), Cost estimates, Metallurgical furnaces, Reverberatory furnaces, Furnace cupolas, Lead (Metal), Calcium oxides, Brasses, Aluminum, Zinc, Roasters, Scrubbers, Electrostatic precipitators, Air washers, Contactors.

A presentation of formalized information on air pollution control for processes in the lime and secondary non-ferrous smelting industries. Three specific kinds of information are presented: (1) Narrative descriptions of the specific processes, the associated air pollution control equipment and the problems special to the processes. (2) The preparation of specifications and cost estimates for equipment to serve each of the specified processes. (3) A tabulation of the past installations, and all of the available test data for each of these industries after January 1, 1960. (Author)

PB-198 150
Southern Research Inst., Birmingham, Ala.
AN ELECTROSTATIC PRECIPITATOR SYSTEMS STUDY.
Final rept. 15 Apr-69-30 Sep 70.
30 Oct 70, 70p* A-378-2291-19
Contract PHS-CPA-22-69-73

Descriptors: (*Air pollution control equipment, *Electrostatic precipitators), (*Dust control, Electrostatic precipitators), Metal industry, Chemical industry, Petroleum industry, Paper industry, Electric power plants, Design, Particles, Reviews.

The report reviews the status of precipitator technology and the application of electrostatic precipitators in industrial dust control. The industries mentioned include: Cement, pulp and paper, magnesia, phosphorus, lime, gypsum, sulfuric acid, petroleum, iron and steel, electric power generation, nonferrous metals, and incinerators.

PB-198 204
Avco Everett Research Lab., Everett, Mass.
FEASIBILITY STUDY OF REMOTE MONITORING OF GAS POLLUTANT EMISSIONS BY RAMAN SPECTROSCOPY.
Research rept.,
Donald A. Leonard. Dec 70, 52p* AERL-RR-362 APTD-0658
Contract PHS-CPA-22-69-62

Descriptors: (*Air pollution, *Monitors), (*Raman spectroscopy, Air pollution), (*Sulfur dioxide, Monitors), (*Nitrogen oxides (NO), Monitors), Flue gases, Lasers, Infrared spectrometers, Scattering, Water vapor, Oxygen, Feasibility.
Identifiers: *Laser spectroscopy, *Air pollution detection.

The feasibility of using laser Raman scattering to remotely monitor the emission of NO and SO2 from large stationary sources such as electric power plants was studied. Since no previous experimental measurement of the Raman scattering cross-sections was known to have been made for either NO or SO2, these cross-sections were measured in the laboratory using a 3371 A pulsed nitrogen laser as the Raman exciting source. Using N2 as a normalizing standard, the results are best fit by a NO to N2 Raman cross-section ratio of 0.5 + 0.1 and a SO2 to N2 Raman cross-section ratio of 2.4 plus or minus 0.3. In addition to the cross-section measurements, a field study was carried out with a laser Raman spectrometer utilizing a 3371 A pulsed nitrogen laser installed in a van at the site of large electric power plant. Raman spectra of N2, O2, H2O and CO2 were obtained from the power plant stack plume at a slant range of 625 feet without interference and detailed field procedures have been developed which permit quantitative profiles of the concentration of these molecules in the plume to be routinely obtained. However, NO and SO2 were not observed in the field study, due primarily to the insufficient stray light rejection ratio of the monchrometer used in the present system. (Author)

PB-198 220
Maine Univ., Orono. Dept. of Chemical Engineering.
INDUCED AIR MIXING OF LARGE BODIES OF POLLUTED WATER,
Stefan A. Zieminski, and Raymond C. Whittemore. Nov 70, 58p W71-06245, EPA-WQO-16080-DWP-11/70
Paper copy available from SOD $0.60 as I67.13/4:16080DWP11/0.

Descriptors: (*Reservoirs, Mixing), (*Sediments, Mixing), (*Aeration, Reservoirs), Air flow, Bubbles, Diffusion, Lakes, Biochemical oxygen demand, Dissolved gases, Oxygen, Water quality, Water pollution.
Identifiers: Eutrophication.

Induced air mixing of large bodies of water was investigated. The objective was to conduct a pilot-scale study to estimate the effects of variables such as the air flow rate, geometry of the body of water, energy input, size of air bubbles, and the pumping capacity of the air plume on the time of mixing. The latter was defined as the time required to reach 90% of the equilibrium concentration of the KCl tracer. In the study emphasis was put on the direction and relative magnitudes of the variables in order to obtain guidelines for large-scale investigation. Considerable time was spent on the development of the various experimental techniques. The tests were conducted in a plexiglas tank of 180 gallons capacity. It is stressed that the induced air system was investigated only from the viewpoint of its mixing performance. Its effect on aquatic life was not considered. (Author)

PB-198 221
Gulf South Research Inst., New Iberia, La.
METHANOL REQUIREMENT AND TEMPERATURE EFFECTS IN WASTEWATER DENITRIFICATION,
Shirish G. Dholakia, James H. Stone, and Harry P. Burchfield. Aug 70, 46p EPA-WQO-17010-DHT-09/70, W71-06246
Contract DI-14-12-527
Paper copy available from SOD $0.50 as I67.13/4:17010DHT09/0.

Descriptors: (*Water pollution, *Nitrates), (*Sewage treatment, *Denitration), (*Chemical removal (Sewage treatment), *Nitrates), (*Nutrients, Chemical removal (Sewage treatment)), (*Biodeterioration, Nitrates), Methyl alcohol, Metabolism, Microorganisms, Pilot plants, Oxygen, Dissolved gases, Temperature.
Identifiers: *Water pollution control.

The removal of eutrophying nutrients from wastewater effluent is of first rank priority in pollution control. One of the major problems is the removal of low concentrations of nitrogen from large volumes of water at an acceptable cost. A pilot-scale, denitrifying plant was built using two types of continuous-flow reactors, a packed column and a suspended growth chamber. Denitrification at three temperature regimes and three dissolved oxygen levels was studied as a function of the methanol:NO3-N ratio. The most efficient ratio was usually found to be between 2:1 and 3:1. Effective denitrification at lower temperatures and high dissolved oxygen content required ratios equal to or slightly greater than 3:1. (Author)

PB-198 222
IIT Research Inst., Chicago, Ill.
DEVELOPMENT OF PHOSPHATE-FREE HOME LAUNDRY DETERGENTS,
Karl A. Roseman, and Warner M. Linfield. Dec 70, 113p* EPA-WQO-16080-DVF, W71-06247
Contract DI-14-12-575
Paper copy available from SOD $1.00 as I67.13/4:16080DVF 12/70.

Descriptors: (*Detergents, Formulations), (*Chelating agents, Detergents), (*Surfactants, Detergents), Cleaning, Tests, Synthesis (Chemistry), Phosphates, Carboxymethyl cellulose, Alkalinity, pH control, Citrates, Sodium inorganic compounds, Abatement, Water pollution, Acetates, Sulfonates.
Identifiers: *Sodium citrates, *Acetic acid/nitrilotri, *Sodium nitrilotriacetate, *Benzene sulfonic acid/dodecyl- (sodium-salt).

Basic studies were performed towards the development of phosphate-free home laundry detergents. Five surfactants were synthesized with the idea that they might possess hard ion chelating properties. The cleaning abilities of these materials were compared to the widely used linear alkylbenzene sulfonate as incorporated into the same formulations. The detergent compositions contained 2% carboxymethylcellulose and the silicate content was varied. Sodium acetate and sodium carbonate were investigated as possible reservoirs of alkalinity. Surfactant compatibility with sodium chloride and sodium sulfate was examined. Other additives included trisodium nitrilotriacetate and sodium citrate at moderate levels. Fifteen detergent formulations were screened and the results leave little doubt that acceptable phosphate-free home laundry detergents can be developed. (Author)

PB-198 223
Winona State Coll., Minn.
MAYFLY DISTRIBUTION AS A WATER QUALITY INDEX.
Final rept.,
Calvin R. Fremling. 15 Nov 70, 44p W71-06248, EPA-WQO-16030-DQH-11/70
Grant FWPCA-WP-00987
Paper copy available from SOD $0.50 as I67.13/4:16030-DQH-11/70.

Descriptors: (*Water pollution, Indicator species), (*Water quality, *Indicator species), Rivers, Insects, Anaerobic conditions, Hydrogen sulfide, Metals, Distribution (Property), Seasonal variations, Toxicology.
Identifiers: *Plectoptera, *Mayflies, *Water pollution effects (Animals), *Mississippi River, *Hexagenia.

Three species of burrowing mayflies (Hexagenia bilineata, Hexagenia limbata, and Pentagenia vittigera) are sufficiently abundant to cause nuisance problems along portions of the Mississippi River. Mayfly distribution, as determined by collections made by ship captains and other cooperators over a 13-year period, has proven to be an excellent index of general water quality on a river which is so large that it cannot be monitored effectively or economically by standard methods. Pollutants have severely reduced the numbers of all three species for 30 miles below Minneapolis, Minnesota, and for over 300 miles below St. Louis, Missouri. Impoundment and enrichment of the Upper Mississippi River has temporarily increased the carrying capacity of the river for H. bilineata which now dominates areas formerly dominated by H. limbata. Methods have been developed to rear large numbers of Hexagenia nymphs in the laboratory. Bioassay tests utilizing artificial, burrow-containing substrates reveal that H. bilineata nymphs can survive anaerobic conditions for as long as 11 hours. (Author)

PB-198 224
Aerojet-General Corp., El Monte, Calif. Environmental Systems Div.
INVESTIGATION OF MEANS FOR CONTROLLED SELF-DESTRUCTION OF PESTICIDES,
Keith H. Sweeny, and James R. Fischer. Jun 70, 131p* W71-06249 EPA-WQO-16040-ELO-06/70
Contract DI-14-12-596
Paper copy available from SOD $1.25 as EP 2.10:16040ELO06/70.

Descriptors: (*DDT, *Decomposition), (*Pesticides, Decomposition), (*Chlorine organic compounds, Decomposition), Insecticides, Zinc, Coatings, Soil chemistry, Reduction (Chemistry), Catalysis, pH, Chemical removal (Water treatment), Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor.
Identifiers: *Ethane/bis (chlorophenyl), Toxaphene, DDE pesticide.

Laboratory studies demonstrated the feasibility of controlled destruction of chlorinated pesticides such as DDT. The concept comprised (1) means to degrade DDT to a harmless form, and (2) methods to delay the reaction for given pest-control action. Chemical methods for degrading DDT were screened and reduction was selected as the most promising technique. Destruction of DDT, without forming DDE as a product, was demonstrated by mildly acidic reduction with zinc powder. The principal product is bis (p-chlorophenyl)ethane, DDT with all three aliphatic chlorines removed; a material stated to be 'void of the neurotoxic effects of DDT.' Catalysis of the reaction resulted in complete destruction of DDT in 1 hr at 25C and conversion to bis (chlorophenyl)ethane in 4-8 hrs. Catalyzed aluminum or iron reduction of DDT produced tetra (p-chlorophenyl)tetrachlorobutane, reportedly lipoid insoluble. Reductive degradation of dieldrin, endrin, aldrin, chlordane, heptachlor, toxaphene, and selected polychlorinated biphenyls was also shown. A 90% destruction of DDT in laboratory soil was shown in 4 days by this technique. Degradation of DDT in water was demonstrated also, a 421 mg/l suspension being reduced to 1 ppm after 1 hr reaction at 75C. Reaction delay can be achieved with wax or silyl coatings which are slowly dissolved or eroded. Coatings were produced which stopped zinc-acid reaction. (Author)

PB-198 225
Brookhaven National Lab., Upton, N.Y.
TREATMENT OF ACID MINE DRAINAGE BY OZONE OXIDATION,
M. Beller, C. Waide, and M. Steinberg. Dec 70, 99p W71-06250, EPA-WQO-14010-FMH-12/70
Contract DI-14-12-838
Paper copy available from SOD $1.00 as EP 2.10:14010FMH12/70.

Descriptors: (*Water pollution, *Mine waters), (*Coal mines, Water pollution), (*Oxidation, Mine waters), (*Neutralizing, Mine waters), (*Ozone, Production), Calcium oxides, Electric discharges, Economic analysis, Cost estimates, Iron inorganic compounds, Ozonization, Nuclear reactions, Chemical engineering.
Identifiers: *Water pollution control.

An engineering design and economic study to evaluate the feasibility of ozone oxidation and limestone neutralization of Acid Mine Drainage (AMD) was performed. The study concludes that an ozone process is feasible, compares economically with existing processes, and offers potential advantages in process control, reduced neutralization costs, and simplified AMD sludge handling and disposal. Ozone production by electric discharge and radiation processes are compared both for on-site and central plant installations utilizing ozone shipping and storage facilities. A central chemonuclear ozone production plant with a distribution system is found to be most economical, followed by electric discharge central and on-site plants. Design and construction of a mobile pilot plant which employs electric discharge ozonizers is recommended for field trials of the process. (Author)

PB-198 226
Robert S. Kerr Water Research Center, Ada, Okla.
INDUCED HYPOLIMNION AERATION FOR WATER QUALITY IMPROVEMENT OF POWER RELEASES.
Water pollution control research series,
Lowell E. Leach, William R. Duffer, and Curtis C. Harlin, Jr. Oct 70, 43p W71-06251, EPA-WQO-16080-10/70
Paper copy available from SOD $0.50 as EP.10:16080-10/70.

Descriptors: (*Reservoirs, *Aeration), (*Thermoclines, Reservoirs), (*Water quality, Reservoirs), Mixing, Lakes, Dissolved gases, Oxygen, Stratification, Stream flow, Sampling.
Identifiers: *Water pollution control.

Conventional hydraulic structures in most dams withdraw low flow and power releases from the poor quality hypolimnion waters during summer stratification resulting in serious degradation of long reaches of streams below dams. Induced aeration of hypolimnion waters during summer stratification has great potential in water quality management of power releases, low flow releases, and limited volumes of impoundments without costly modification of existing outlet works. Hypolimnion aeration research on power discharge quality improvement was conducted at Eufaula Reservoir in southeastern Oklahoma during the summer of 1968. Dissolved oxygen transfer efficiency of the aeration system ranged from 1.8 to 3.0 pounds of dissolved oxygen per horsepower-hour of expended energy resulting in an operating cost of 4.10 to 6.25 dollars per 1,000 pounds of oxygen incorporated into the power releases. Additional research for development and optimization of the induced aeration system is discussed. (Author)

PB-198 227
Envirogenics Co., El Monte, Calif.
FEASIBILITY ANALYSIS OF INCINERATOR SYSTEMS FOR RESTORATION OF OIL CONTAMINATED BEACHES,
R. M. Roberts, and T. S. Hoyt. Nov 70, 83p W71-06252, EPA-WQO-15080-DXE-11/70
Contract DI-14-12-595
Paper copy available from SOD $0.75 as I67.13/4:15080-DXE-11/70.

Descriptors: (*Beaches, *Cleaning), (*Water pollution, Oils), (*Incinerators, Sands), Coasts, Design, Combustion, Thermodynamics, Mobile equipment, Cost estimates.
Identifiers: *Oil pollution.

The feasibility of employing a combustion process for restoring oil contaminated beaches was investigated. Beach access problems and the handling characteristics of shore materials limited the potential application to recreational (sand) sites. Thermodynamic arguments required that a system design be adopted in which the contaminated sand would undergo combustive processing in a confined arrangement. The design selected, from those analyzed, proved to be a three-effect combustor based on the rotary kiln principle. Provided that the sand to be cleaned is carefully enough collected to furnish a reasonable (> or = 6%) oil content and is moved away from the surf and drained to an acceptable moisture level (> or = 6%), basic processing costs would be highly attractive. In comparison with uncontaminated sand, the cleaned product exhibits only a slightly greyish hue. (Author)

PB-198 228
Franklin Inst. Research Labs., Philadelphia, Pa.
SELECTED URBAN STORM WATER RUNOFF ABSTRACTS, JULY 1968-JUNE 1970.

Jul 70, 385p EAP-WQO-11024-EJC-07/70, W71-06253
Contract FWQA-14-12-904
Paper copy available from SOD $2.75 as EP 2.10:11024 EJC 07/70.

Descriptors: (*Surface water runoff, *Bibliographies), (*Urban areas, Surface water runoff), (*Water pollution, Sewage), (*Storm sewers, Water pollution), Abstracts, Water quality, Surface drainage, Sewers, Sewage treatment, Urbanization, Water treatment, Tunneling (Excavation), Flood control, Overflows, Hydrology, Combined sewers.

A compilation of abstracts summarizing articles from a variety of technical publications constituting the problem of urban drainage was developed by the Franklin Institute Research Laboratories. The present work includes 599 abstracts of documents published for the most part from July 1968 through June 1970. The abstracts are classed in ten sub-topic categories and arranged alphabetically by author and numerically by abstract number within each category. Each item includes a bibliographic citation, an abstract, and a set of indexing descriptors and identifiers. A cumulative subject index at the end of the volume provides the necessary access to individual concepts. An author index and journal list are also included. (WRSIC abstract)

PB-198 229
Franklin Inst. Research Labs., Philadelphia, Pa.
SELECTED URBAN STORM WATER RUNOFF ABSTRACTS.
Quarterly issue no. 1.
Oct 70, 46p W71-06254, EPA-WQO-11024-EJC-10/70
Contract DI-14-12-904
Paper copy available from SOD $0.50 as EP2.10:11024-EJC10/70.

Descriptors: (*Surface water runoff, *Abstracts), (*Urban areas, Drainage), (*Water pollution, Control), Storms, Storm sewers, Combined sewers, Indexes (Documentation), Overflows, Dams, Construction materials, Rivers, Feasibility, Reviews.

The first quarterly supplement to SELECTED URBAN STROM WATER RUNOFF ABSTRACTS is a compilation of abstracts summarizing articles from a variety of technical literature concerning the problem of urban drainage published from July 1970 through September 1970. The 36 abstracts covering a range of eight sections are arranged alphabetically by author and numerically by abstract number within each category. Each item includes a bibliographic citation, an abstract, and a set of indexing descriptors and identifiers. A cumulative subject index at the end of the volume provides the necessary access to individual concepts. An author index and journal list are also included. (Author)

PB-198 230
Black, Sivalls and Bryson, Inc., Pittsburgh, Pa. Applied Technology Div.
CARBONATE BONDING OF COAL REFUSE.
Water pollution control research series,
Paul J. LaRosa, James A. Karnavas, and Eugene A. Pelczarski. Feb 71, 57p W71-06256, EPA-WQO-14010-FOA-02/71
Paper copy available from SOD $0.60 as EP 2.10:14010FOA02/71.

Descriptors: (*Coal, Waste disposal), (*Binders (Materials), Coal), (*Construction materials, Coal), (*Coal mines, *Waste disposal), Calcium carbonates, Compacting, Calcium oxides, Coatings, Water pollution, Bricks.
Identifiers: *Solid waste disposal, *Water pollution contro.

A laboratory study of the variables which affect the properties of the carbonate bonded coal refuse has been made. The carbonate bonding process utilizing coal refuse as a fill material consists of mixing coal refuse with water and lime hydrate, compacting the mixture, and reacting it with a carbon-dioxide-rich gas to form a coherent structure bonded by a matrix of calcite crystals. The resulting carbonate bonded coal refuse can be used in road building or as a coal refuse pile sealant to minimize acid mine water pollution. Four types of coal refuse were investigated--a relatively unoxidized and highly oxidized bituminous coal refuse and a relatively unoxidized and highly oxidized anthracite coal refuse. It was found that compressive strengths of 2200 to 4400 psi were obtained for the four types of coal refuse investigated using up to 12 percent lime hydrate and 9 to 15 percent water. In general, the compressive strength of the carbonate bonded coal refuse increases with increasing lime hydrate content, reaction time and carbon dioxide concentration in the carbonate bonding reaction gas. The air and water permeability of carbonate bonded coal refuse was found to be comparable to concrete. An approximate cost comparison between carbonate bonded coal refuse and other construction materials and techniques indicated that the carbonate bonding process utilizing coal refuse is the least cost means available for coal refuse pile sealing and road building. (Author)

PB-198 231
National Canners Association, Berkeley, Calif. Western Research Lab.
WASTE REDUCTION IN FOOD CANNING OPERATIONS: A STUDY OF FOUR METHODS TO IMPROVE THE QUALITY OR REDUCE THE QUANTITY OF EFFLUENT DISCHARGED BY A FRUIT PROCESSING PLANT.
Water pollution control research series,
Walter A. Mercer, and Walter W. Rose. Aug 70, 96p W71-06257, EPA-WQO-12060-08070
Grant WPRD-151-01-68
Paper copy available from SOD $1.00 as I67.13/4:12060-08/70.

Descriptors: (*Water pollution, *Industrial wastes), (*Food processing, *Sewage treatment), (*Canneries, *Industrial waste treatment), Fruits, Trickling filters, Water quality, Acidification, Flotation, Separators, Suspended sediments, Biochemical oxygen demand, Tomatoes, Peaches.
Identifiers: Water pollution control.

To produce the canning industry's annual nationwide pack of 760 million cases of canned foods, more than 36 billion gallons of water is required. In comparison with domestic sewage, food processing wastes are much higher in pollutional strength. Thus the research described discusses the designing of larger-scale experimentation treatment of food processing wastes. Objectives of the project were as follows: To develop information on the effectiveness of treating strong liquid wastes with a high-rate trickling filter; To evaluate under cannery conditions the effects of controlling, by the addition of edible acids, the sanitary condition of waters recirculated in product pumping and fluming systems, and to determine if the total organic waste load discharged; To determine the effectiveness of air-flotation systems for removing suspended solids; To evaluate the performance of center-discharge, fine-screen separators in removing suspended solids; and To select, on the basis of results obtained, a system or systems to be enlarged in scale. (Author)

PB-198 232
Oregon State Univ., Corvallis. Dept. of Civil Engineering.
AERIAL PHOTOGRAPHIC TRACING OF PULP MILL EFFLUENT IN MARINE WATERS.
Water Pollution control series,
Fred J. Burgess, and Wesley P. James. Aug 70, 165p W71-06258, EPA-WQO-12040-EBY-08/70
Grant FWQA-WP-00524
Paper copy available from SOD $1.25 as I67.13/4:12040-EBY-08/70.

Descriptors: (*Water pollution, *Spent liquors (Pulping)), (*Paper industry, Water pollution), (*Aerial photography, Water pollution), Kraft paper, Sulfate pulps, Pacific Ocean, Detection, Sampling, Computer programs, Mixing, Concentration (Composition), Coasts, Remote sensing.
Identifiers: *Water pollution detection.

Aerial photography taken of waste plumes from Kraft pulp mill ocean outfalls was shown to be an effective tool in the study of waste disposal sites. This technique is not limited by sea conditions and permits monitoring and evaluation of outfall sites throughout the year. Photography taken at one instant provides comprehensive information throughout the waste field. Manpower requirements and costs for this method are considerably less than for conventional boat sampling surveys. Field studies were conducted on the waste plumes from Kraft pulp mill ocean outfalls at Newport and Gardiner, Oregon and Samoa, California. Waste concentrations were measured by conventional boat sampling techniques while aerial photography was taken of the outfall area from altitudes ranging from 3,000 to 11,000 ft. Computerized procedures were used to compute water currents, waste concentrations, toxicity zones and diffusion coefficients from the photography. The maximum concentration determined over the outfall for each field study was generally less than that shown to have a detrimental effect on young salmon for a 14-day exposure. Surface water current was found to be the dominant factor in the resulting plume pattern. During periods of low current velocities in the receiving water, the hydraulic head created by the effluent source was a significant factor in the resulting plume shape. The steady state form of the Fickian diffusion equation and unidirectional transport velocity was not applicable to the majority of the observations. (Author)

PB-198 239
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
X-RAY FLUOROSCOPIC SCREENS-HISTORY, CRYSTAL KINETICS, PRELIMINARY REPORT ON AGING,
William S. Properzio, and Dale Trout. Feb 71, 61p BRH-DMRE-71-2
Paper copy available from SOD as HE20.1516:71-2 $0.60.

Descriptors: (*Fluoroscopes, Fluoroescent screens), (*Fluorescent screens, Aging (Materials)), Radiation damage, Deterioration, Phosphorescent materials, Crystals, Scintillation.

A preliminary report is made on a long-range study of the factors which reduce the light output of fluoroscopic screens. New screens are being exposed to x-rays, sunlight, incandescent lamps and fluorescent lamps. The light output of these screens is measured monthly. Comparative measurements are also being made on older screens. These measurements indicate that the new phosphors and technological advances over a 40-year period have enabled a decrease in patient exposure by a factor of eight to ten. Based on the study results, it is recommended that all fluoroscopic screens made before 1947 should be replaced with screens incorporating the new phosphors and technological advances. (Author)

PB-198 240
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
A RADIATION SURVEY OF TELEVISION REPAIR SHOPS IN THE BALTIMORE AREA,
John L. Wyatt, Jr., and Thomas M. Moore. Mar 71, 49p BRH/DEP 71-4
Paper copy available from SOD $0.50/copy, HE20.1513:71-4.

Descriptors: (*Radiation hazards, *Repair shops), (*Maintenance personnel, Radiation hazards), (*Television receivers, Radiation hazards), Color television, Color television tubes, Electronic technicians, Surveys, X rays.
Identifiers: *Television repair shops, Baltimore (Maryland).

A pilot study of the radiation exposure to television repair technicians during the course of their work was performed in 70 Baltimore-area television repair shops from March to October 1970. In the first 25 shops, personnel dosimeters were distributed to the repair technicians, and radiation exposure measurements were made on 58 color television receivers representing 15 different brands. In the remaining shops, no radiation measurements were made on receivers, but dosimeters were distributed to the technicians to enlarge the statistical base for personnel exposure determinations. The survey data indicated that the radiation doses received by the technicians were relatively low. Hence, it was concluded that a national survey does not appear necessary. (Author)

PB-198 299
TRW Systems Group, Washington, D.C. Washington Operations.
AIR QUALITY IMPLEMENTATION PLANNING PROGRAM. VOLUME 1: OPERATOR'S MANUAL.

Nov 70, 344p* SN-11130-Vol-1 APTD-0640
Contract PH-22-68-60
See also Volume 2, PB-198 300.

Descriptors: (*Air pollution, *Regional planning), (*Computer programs, Air pollution), (*Sulfur dioxide, Air pollution), (*Particles, Air pollution), Standards, Government policies, State government, Meteorological data, Atmospheric motion, Air pollution control equipment, Effectiveness, Abatement, Cost estimates, Combustion products, Flue gases, Atmospheric composition, Manuals.

The Implementation Planning Program is a collection of computer programs designed to assist the state governments in preparing their implement action plans for sulfur oxides and particulates. The report describes the individual programs, their input data requirements and the output information generated. It also provides a detailed user's guide for the step-by-step preparation of inputs to the program. The individual programs are as follows: Source Data Management Program, Air Pollutant Concentration Program, Source contribution File Merger Program, Control Cost Program Control Cost File Update Program, Emission Standards Program, Emissions Standards File Update Program, and Regional Strategies Program. (APCO abstract)

PB-198 300
TRW Systems Group, Washington, D.C. Washington Operations.
AIR QUALITY IMPLEMENTATION PLANNING PROGRAM VOLUME II - PROGRAMMER'S MANUAL.
Nov 70, 526p* SN-11130-Vol-2 APTD-0641
Contract PH-22-68-60
See also Volume 1, PB-198 299.

Descriptors: (*Programming manuals, Air pollution), (*Air pollution, *Regional planning), (*Computer programs, Air pollution), (*Sulfur dioxide, Air pollution), (*Particles, Air pollution), Standards, Combustion products, Government policies, State government, Meteorological data, Atmospheric motion, Air pollution control equipment, Effectiveness, Abatement, Cost estimates, Flue gases, Atmospheric composition.

The Implementation Planning Program is a collection of computer programs designed to assist the State governments in preparing their implementation plans for sulfur oxides and particulates. The report is designed to be used to assist the user in the installation, verification and maintenance of the component programs of the Implementation Planning Program. The component programs are as follows: Sour File Maintenance Program, Air Pollution Concentration Program, Source Contribution File merge program, Control Cost Program, Control Cost File Update Program, Emission Standards Program, Emission Standards File Update Program, Regional Strategies Program. (APCO abstract)

PB-198 312
Franklin Inst. Research Labs., Philadelphia, Pa.
SELECTED URBAN STORM WATER RUNOFF ABSTRACTS.
Quarterly issue no. 2.
Jan 71, 54p W71-06255, EPA-WQO-11024-EDC-01/71
Contract DI-14-12-904
Paper copy available from SOD $0.60 as EP2.10:11024EJC01/71. See also Quarterly issue no. 1, PB-198 229.

Descriptors: (*Surface water runoff, *Abstracts), (*Urban areas, Drainage), (*Water pollution, Control), Storms, Storm sewers, Indexes (Documentation), Overflows, Combined sewers, Floods, Reviews.

The second quarterly supplement to SELECTED URBAN STORM WATER RUNOFF ABSTRACTS is a compilation of abstracts summarizing articles from a variety of technical literature concerning the problem of urban drainage published from October 1970 through December 1970. The 50 abstracts covering a range of ten sections are arranged alphabetically by author and numerically by abstract number within each category. Each item includes a bibliographic citation, an abstract, and a set of indexing descriptors and identifiers. A cumulative subject index at the end of the volume provides the necessary access to individual concepts. (Author)

PB-198 329
Environmental Protection Agency. Research Triangle Park, N. C. Air Pollution Control Office.
1969 INVENTORY OF AIR POLLUTION MONITORING EQUIPMENT OPERATED BY STATE AND LOCAL AGENCIES.
Mar 71, 33p APTD-0588

Descriptors: (*Air pollution, *Monitors), Inventories, State government, Gas detectors, Measuring equipment, Samplers, Urban areas.
Identifiers: *Air pollution detection.

The Division of Air Quality and Emission Data of the Air Pollution Control Office of the Environmental Protection Agency has inventoried the air pollution monitoring equipment operated by state and local agencies in the 50 states, District of Columbia, and Puerto Rico. Reported by state, city and organization are the automatic sampler-analyzers, mechanized samplers, and static sample-collection devices enumerated in the survey for the period July 1, 1968, through June 30, 1969. Included are a sample survey questionnaire, a tabulation of equipment totals, and a glossary of abbreviations and terms. (Author)

PB-198 348
Kearney (A. T.) and Co., Chicago, Ill.
SYSTEMS ANALYSIS OF EMISSIONS AND EMISSIONS CONTROL IN THE IRON FOUNDARY INDUSTRY. VOLUME I. TEXT.

Feb 71, 368p* APTD-0644
Contract CPA-22-69-106
See also Volume 2, PB-198 349.

Descriptors: (*Air pollution, *Industrial wastes), (*Foundries, Air pollution), (*Air pollution control equipment, Foundries), (*Iron and steel industry, Air pollution), Abatement, Systems analysis, Particles, Oxides, Gray iron, Furnace cupolas, Electric arc furnaces, Dust control, Induction furnaces, Reverberatory furnaces, Cost analysis, Foundry practice, Sampling, Cyclone separators, Molding materials, Scrubbers, Gas filters, Electrostatic separators, Economic analysis, Cost estimates, Expenses.
Identifiers: *Air pollution control.

The report presents the text of a study which attempts to define the air pollution problems of the iron foundry industry and to set priorities for research and development activities that will lead to improved emission control capabilities at reduced cost. The following areas are covered extensively: foundry emissions produced and control capability thereof; the quantification and evaluation of emissions; technical and economic analysis of emission control technology; technical and economic analysis of potential modifications to foundry processes and equipment; projection of trends; and recommended research and development. (APCO abstract)

PB-198 349
Kearney (A. T.) and Co., Chicago, Ill.
SYSTEMS ANALYSIS OF EMISSIONS AND EMISSIONS CONTROL IN THE IRON FOUNDRY INDUSTRY. VOLUME II. EXHIBITS.

Feb 71, 175p* APTD-0645
Contract CPA-22-69-106
See also Volume 1, PB-198 348 and Volume 3, PB-198 350.

Descriptors: (*Air pollution, *Industrial wastes), (*Foundries, Air pollution), (*Air pollution control equipment, Foundries), (*Iron and steel industry, Air pollution), Abatement, Systems analysis, Particles, Oxides, Diagrams, Charts, Engineering drawings, Cost estimates, Expenses, Foundry practice, Scrubbers, Gas filters, Electrostatic separators, Cyclone separators, Dust control, Cost analysis.
Identifiers: *Air pollution control.

The report contains a list of drawings and diagrams which are coordinated with the text in Volume I (PB-198 348) which discusses a study conducted for the purpose of defining the air pollution problems of the iron foundry industry and of setting priorities for research and development activities that will lead to improved emission control capabilities at reduced cost.

PB-198 350
Kearney (A. T.) and Co., Chicago, Ill.
SYSTEMS ANALYSIS OF EMISSIONS AND EMISSIONS CONTROL IN THE IRON FOUNDRY INDUSTRY. VOLUME III. APPENDIX.

Feb 71, 346p* APTD-0646
Contract CPA-22-69-106
See also Volume 2, PB-198 349.

Descriptors: (*Air pollution, *Industrial wastes), (*Foundries, Air pollution), (*Air pollution control equipment, Foundries), (*Iron and steel industry, Air pollution), (*Bibliographies, Air pollution), Particles, Tables (Data), Heat balance, Material balance, Economic analysis, Cost analysis, Charts, Sampling, Abatement, Particles, Oxides, Foundry practice.
Identifiers: *Air pollution control, *Air pollution detection.

The report consists of the following appendices: Bibliography, Data bank, material and heat balance of foundry melting furnaces, Detail Economic Cost Curves, Emission Test Procedure, and Glossary of terms for a study which was conducted for the purpose of defining the air pollution problems of the iron industry and of setting priorities for research and development activities that will lead to improved emission control capabilities at reduced cost.

PB-198 375
Southwestern Radiological Health Lab., Las Vegas, Nev.
THE DESIGN AND CONSTRUCTION OF A LASER METER FOR THE MEASUREMENT OF CW IRRADIANCE AT 632.8 NANOMETERS,
Richard W. Peterson, Wilbur F. Van Pelt, and Harold F. Stewart. Nov 70, 26p BRH/SWRHL-70-2

Descriptors: (*Optical measuring instruments, *Coherent radiation), (*Laser beams, Measurement), Helium neon lasers, Circuits, Power measurements, Light (Visible radiation), Calibrating, Transmissometers, Design.
Identifiers: Laser radiation protection.

A description of the design and construction of a meter capable of measuring scattered levels of irradiance (power density) resulting from the operation of low power, continuous wave, helium-neon gas lasers is presented. Readilty available components are used and the techniques for calibration and use of the instrument are discussed. The instrument responds to irradiances of 10 microwatts/sq. cm. or greater depending on the aperture size selected by the user. (Author)

PB-198 392
United Aircraft Corp., East Hartford, Conn. Research Labs.
TECHNOLOGICAL AND ECONOMIC FEASIBILITY OF ADVANCED POWER CYCLES AND METHODS OF PRODUCING NONPOLLUTING FUELS FOR UTILITY POWER STATIONS.
Final rept. 1 Jul 69-31 Dec 70,
F. L. Robson, A. J. Giramonti, G. P. Lewis, and G. Gruber. Dec 70, 569p* UARL-J970855-13 APTD-0661
Contract CPA-22-69-114

Descriptors: (*Air pollution, *Sulfur dioxide), (*Electric power plants, Air pollution), (*Desulfurization, *Fossil fuels), (*Coal, Desulfuri

tion), Steam electric power generation, Electric power generation, Gas turbine power generation, Operating costs, Engineering drawings, Economic analysis, Petroleum.
Identifiers: COGAS power system.

Analytical studies have been made to identify the technical and economic factor that will govern future selection of fuel cleanup processes and advanced-cycle central power stations which, in combination, will be capable of producing electric power at the lowest possible cost while reducing substantially the emissions of sulfur oxide pollutants resulting from the combustion of high-sulfur coal and residual fuel oil. The technical approach was based upon technology currently available, but possibly not reduced to commercial practice as well as technology judged attainable for commercial use within the next ten and twenty years. This approach included evaluations of current and projected; fossil-fuel desulfurization and conversion processes, current and advanced-cycle central power stations, and integrated fuel cleanup and power stations. (APCO abstract)

PB-198 394
Environmental Protection Agency, Research Triangle Park, N.C. Air Pollution Control Office.
ASBESTOS AND AIR POLLUTION: AN ANNOTATED BIBLIOGRAPHY.

Feb 71, 105p* AP-82
Paper copy available from SOD $0.50 as FS2.300-AP-82.

Descriptors: (*Air pollution, *Asbestos), (*Bibliographies, Asbestos), (*Asbestosis, Bibliographies), Abstracts, Measuring instruments, Control, Cancer, Public health, Dust.
Identifiers: Air pollution control, Air pollution detection, Air pollution effects (Animals).

An annotated bibliography containing 60 abstracts of articles on asbestos. The contents are divided into the following categories: General, Emission Sources, Measurement Methods, Control Methods, Effects-Human Health, and Basic Science and Technology. (Author)

PB-198 400
Environmental Protection Agency. Research Triangle Park, N.C. Air Pollution Control Office.
PROCEEDINGS OF SYMPOSIUM ON MULTIPLE-SOURCE URBAN DIFFUSION MODELS,
Arthur C. Stern. 1970, 416p* AP-86
Paper copy available from SOD. $1.75 as FS2.300:AP-86; NTIS MF$0.95.

Descriptors: (*Atmospheric motion, *Air pollution), (*Urban areas, Air pollution), (*Sulfur dioxide, Air pollution), Meetings, Atmospheric diffusion, Mathematical models, Atmospheric models, Temperature, Sampling, Monitors, Meteorological data, Diurnal variations.
Identifiers: *Air pollution detection.

Contents:
- Physical and meteorological basis for mathematical models of urban diffusion processes;
- Prediction of diffusion over an urban area-current practice and future prospects;
- Some miscellaneous aspects of current urban pollution models;
- Development of a practical, multi-purpose urban diffusion model for carbon monoxide;
- An urban atmospheric dispersion model;
- Sensitivities of air quality prediction to input errors and uncertainties;
- Elevation of tracer cloud over an urban area;
- Numerical simulation of the temporal and spatial distributions of urban air pollution concentration;
- A model of diffusion in urban atmospheres: SO2 in greater New York;
- Analysis of multiple-station urban air sampling data;
- Progress + profits + population = pollution;
- Utilization of air pollution models. (Author)

PB-198 406
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
EVALUATION OF LITHIUM FLUORIDE FOR MICROWAVE DOSIMETRY APPLICATIONS.
Technical rept.,
David L. Conover. Apr 71, 29p BRH/DEP-71-6

Descriptors: (*Lithium fluorides, *Luminescent dosimeters), (*Thermoluminescence, Lithium fluorides), Chemical dosimeters, Microwaves.
Identifiers: Microwave dosimeters.

The use of LiF thermoluminescent dosimetry (TLD) material as a dosimeter for microwave radiation was evaluated. Teflon discs impregnated with LiF were subjected to saturation exposures (approximately 100,000 R) of gamma radiation, and these irradiated dosimeters were exposed to microwave radiation at 2450 MHz. Analysis of the relative light output data for the treatment groups indicated that there were no significant differences between groups. Hence, it was concluded that LiF, as used in the study, will not serve as a useful dosimeter for microwave radiation in the 2450-MHz frequency band. (Author)

PB-198 407
Allied Chemical Corp., Morristown, N.J. Industrial Chemicals Div.
APPLICABILITY OF REDUCTION TO SULFUR TECHNIQUES TO THE DEVELOPMENT OF NEW PROCESSES FOR REMOVING SO2 FROM FLUE GASES. VOLUME I.
Final rept. 1 Jun 68-31 Jul 69 on Phase 1.

31 Jul 69, 349p* APTD-0659
Contract PH-22-68-24
See also Volume 2, PB-198 408.

Descriptors: (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, *Reduction (Chemistry)), (*Reviews, Sulfur dioxide), (*Hydrogen sulfide, Chemical engineering), Sulfur, Recovery, Cost analysis, Hydrogen, Carbon monoxide, Methane, Oxidation, Coke, Chemical equilibrium, Thermodynamics.
Identifiers: *Waste gas recovery, *Claus process, *Air pollution control.

The report is Volume I of a two-volume report which summarizes the results and conclusions of a study of SO2 reduction processes. Volume I covers phase I activities, with the aim of establishing the state-of-the-art of reduction to sulfur techniques. Based on a comprehensive literature survey, thirty case studies were worked up covering several types of sulfur oxide stack emissions and several reductants. Each case was based on the best information available, and use of updated technology in devising the process sequence. Flow sheets, operating parameters and economics are reported in the report. (Author)

PB-198 408
Allied Chemical Corp., Morristown, N.J. Industrial Chemicals Div.
APPLICABILITY OF REDUCTION TO SULFUR TECHNIQUES TO THE DEVELOPMENT OF NEW PROCESSES FOR REMOVING SO2 FROM FLUE GASES. VOLUME II.
Final rept. 1 Aug 69-30 Sep 70 on Phase 2.

Nov 70, 183p* APTD-0660
Contract PH-22-68-24
See also Volume 1, PB-198 407.

Descriptors: (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, *Reduction (Chemistry)), (*Hydrogen sulfide, Chemical engineering), (*Adsorbents, *Anilines), Sulfur, Recovery, Reaction kinetics, Concentration (Composition), Mixtures.
Identifiers: *Waste gas recovery, *Claus process, *Air pollution control, *Aniline/N-N-dimethyl.

The report is Volume II of a two-volume report which summarizes the results the conclusions of a study of SO2 reduction processes. Volume II covers the Phase II activities of the study. Four of its five sections deal with experimental studies designed to optimize process conditions and to confirm the validity of assumptions made in Phase I studies. These sections cover (1) Claus Process Kinetics, (2) Intermediate Reactor studies, (3) Low temperature Claus Process studies, and (4) Strong SO2 Reduction studies. The fifth section is a Phase I type study on the use of dimethylaniline to gather the SO2 from smelter gases and deliver a concentrated SO2 gas to a reduction process. (Author)

PB-198 410
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME V. EFFECTS OF METEOROLOGICAL CONDITIONS AND RELIEF ON AIR POLLUTION; AIR CONTAMINANTS - THEIR CONCENTRATION, TRANSPORT, AND DISPERSAL,
M. Y. Nuttonson. Jan 70, 119p* APTD-0639
Grant PHS-AP-00786-01
See also Volume 4, PB-198 064.

Descriptors: (*Air pollution, *Atmospheric motion), (*Urban areas, Air pollution), (*Meteorological data, Air pollution), (*USSR, Air pollution), Industrial wastes, Sulfur dioxide, Nitrogen oxides, Combustion products, Particles, Atmospheric diffusion, Concentration (Composition), Atmospheric precipitation, Dust, Monitors, Fog, Translations.

Contents:
- Study of pollution of city air by industrial discharges;
- Characteristics of the thermal regime of cities;
- Analysis of meteorological conditions of dangerous air pollution in cities;
- Influence of the relief on the propagation of impurities from sources;
- Adsorption of gaseous impurities by fog droplets;
- Recording of dust concentrations in the atmosphere;
- Coefficient of turbulent exchange in the ground layer in the daytime during the summer in various geographical regions of the USSR;
- Physical principles of calculation of dispersal of industrial discharges in the atmosphere;
- AND THE Study of the structure of a smoke jet and determination of the coefficient of turbulent mixing from the vertical distribution of concentrations.

PB-198 413
Pope, Evans and Robbins, Alexandria, Va.
CHARACTERIZATION AND CONTROL OF GASEOUS EMISSIONS FROM COAL-FIRED FLUIDIZED-BED BOILERS.
Interim rept.,
E. B. Robison, A. H. Bagnulo, J. W. Bishop, and S. Ehrlich. Oct 70, 239p* APTD-0655

Descriptors: (*Air pollution, *Combustion products), (*Coal, Air pollution), (*Furnaces, Air pollution), (*Adsorbents, *Limestone), (*Sulfur dioxide, *Adsorption), Fluidized bed processors, Particles, Nitrogen dioxide, Pilot plants, Hydrocarbons, Fly ash, Tests, Boilers, Injection, Cost estimates.
Identifiers: *Air pollution control.

Results are presented from a test program to characterize the air pollution emissions from the combustion of coal in a fluidized bed combustion and to assess the potential of fluidized-bed combustion for air pollution control. These emissions were monitored under a comparatively large number of different conditions. Efforts were made to reduce emissions of oxides of sulfur by the use of limestone-based sorbents and to determine the conditions most favorable for the reduction. Emis-

sions of sulfur dioxide, nitric oxide and hydrocarbon were monitored continuously with periodic samples taken for measurement of particulates and wet test determination of SO (x) and NO (x). When conditions most favorable for air pollution control were established on a pilot scale, the conditions were reproduced in tests with the fluidized-bed boiler module. (Author)

PB-198 427
Tyco Labs., Inc., Waltham, Mass.
SILICATE TREATMENT FOR ACID MINE DRAINAGE PREVENTION, SILICATE AND ALUMINA/SILICA GEL TREATMENT OF COAL REFUSE FOR THE PREVENTION OF ACID MINE DRAINAGE.

Feb 71, 100p W71-07052, EPA-WQO-14010-DLI-02/71
Contract DI-14-12-560
Paper copy available from SOD $1.00 as EP2.10:14010DLI02/71.

Descriptors: (*Water pollution, *Mine waters), (*Coal mines, Water pollution), Neutralization, Coatings, Refuse, Surface water runoff, Gels, Sodium silicates, Weathering, Rubble.
Identifiers: *Mine acid drainage, *Water pollution control, *Coal mine refuse.

A treatment technique has been demonstrated on a laboratory scale which inhibits or prevents the generation of acid mine water from waste coal refuse. Three variations of the general method were considered: Neutralization of the water-accessible refuse with a dilute solution of sodium silicate (waterglass); development of a continuous gel on the refuse surface structure which sealed off the entire pile from natural runoff waters; development within the pile structure of a continuous silica/aluminia gel to eliminate percolation through the refuse and minimize the effect of natural erosion of the gel structure. Comparison of the effluent water with an untreated pile shows that the neutralized pile was effective for a minimum of 120 in. of equivalent rainfall in inhibiting AMD generation. The surface gel was effective for a longer period of time. The most effective treatment utilized a mixed alumina/silica gel formed within the pile at depths up to 6 in. This method was effective for more than 500 in. of equivalent rainfall, the duration of the test, and appeared to be exceptionally stable at that time. The weathering resistance of the treatment methods was evaluated by heating the gel treated refuse in the laboratory and exposing it to rain, snow, and freeze-thaw cycles outdoors. (Author)

PB-198 453
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
TECHNICAL-ECONOMIC EVALUATION OF AIR-POLLUTION CORROSION COSTS ON METALS IN THE U.S.
Final rept.,
F. W. Fink, F. H. Buttner, and W. K. Boyd. 19 Feb 71, 160p* APTD-0654
Contract CPA-70-86

Descriptors: (*Air pollution, *Corrosion), (*Economic analysis, Air pollution), Cost estimates, Corrosion prevention, Maintenance, Steels, Storage tanks, Bridges (Structures), Power transformers, Street lighting, Fences, Wire rope, Sulfur dioxide, Siding, Aluminum, Economic forecasting, Trends.
Identifiers: *Air pollution effects (Materials).

A study was conducted to provide an estimate of the cost to the nation's economy resulting from the corrosion damage to metals by exposure to polluted air. More specifically the major objectives may be stated as follows: Assess the total economic loss to the nation in dollars resulting from the increased corrosion damage of externally exposed structures or systems caused by the presence of man-made pollutants in the atmosphere; and Establish from predicted changes in population, industrial activity, technology of pollution control, corrosion prevention, external structures, and air pollution regulation on the probable size of this economic loss in 1980. (APCO abstract)

PB-198 515
Washington Univ., Seattle. Dept. of Environmental Health.
A COMPARATIVE ANALYSIS OF THE RELATIONSHIP BETWEEN MORTALITY AND AIR POLLUTION AND WEATHER. I. UTILIZING MULTIPLE REGRESSION ANALYSIS.
Final rept.,
John R. McCarroll, and Michael D. Lebowitz. Jun 65, 27p APTD-0650
Contract CPA-22-69-126
See also Part 2, PB-198 516.

Descriptors: (*Air pollution, *Mortality rates), (*Weather, Mortality rates), (*Public health, Air pollution), Urban areas, Application of mathematics, Correlation, Regression analysis.

Multiple regression analysis, with lags, was performed on daily mortality on air pollution and weather variables for three United States cities (New York, Philadelphia, Los Angeles). Relationships between mortality and air pollution weather were found for all three cities. These relationships were consistent within cities, by season. They were also consistent between cities, allowing for generalization about the relationship: daily mortality is associated with air pollution and weather in urban areas of the U. S. This association can be stated as a formal relationship in time. The effect of pollution and weather on mortality is essentially an immediate one. (Author)

PB-198 516
Washington Univ., Seattle. Dept. of Environmental Health.
A COMPARATIVE ANALYSIS OF THE RELATIONSHIP BETWEEN MORTALITY AND AIR POLLUTION AND WEATHER. II. THE STIMULUS. RESPONSE METHOD OF ANALYSIS AND RESULTS,
James McCarroll, and Michael D. Lebowitz. Jun 65, 19p APTD-0651
Contract CPA-22-69-126
See also Part I, PB-198 515.

Descriptors: (*Air pollution, *Mortality rates), (*Weather, Mortality rates), (*Public health, Air pollution), Correlation, Applications of mathematics, Stimulation, Environment, Responses, Models, Urban areas.

This study is a further attempt to find a relationship between daily mortality, air pollution, and weather. New methods were devised for this purpose. The study was comparative. Three U.S. Cities were studied at the same time using the same methods and similar data from each. Due to the insufficient models previously used to study the relationship between mortality and air pollution and weather, a new model was conceptualized. This model, the stimulus-response model, serves as the frame work for extensive analysis of the relationship. The analysis was performed on data from New York City, Philadelphia and Los Angeles. The data included total daily mortality, 65 plus mortality, pollutants and weather. (Author)

PB-198 523
Carnegie-Mellon Univ., Pittsburgh, Pa.
EVALUATION OF PYRITIC OXIDATION BY NUCLEAR METHODS.
Research rept.,
Robert A. Baker. Mar 71, 39p W71-07137, EPA-WQO-14010-FII-03/71
Grant FWPCA-14010-FII
Paper copy available from SOD $0.50 as EP 2.10:14010F1103/71.

Descriptors: (*Pyrite, *Oxidation), (*Mossbauer effect, Pyrite), (*Water pollution, *Mine waters), Iron ores, Sulfide minerals, Iron sulfides, Coal mines, Surface chemistry, Iron sulfate, Hydroxides.
Identifiers: *Mine acid drainage.

Laboratory studies demonstrated the feasibility of using the Mossbauer effect and a backscattering mode of detecting 14.4 Kev gamma rays to spectroscopically monitor the oxidation processes taking place on pyrite materials. A cobaltous oxide form of cobalt-57 was the radiation source. Spectra were obtained of pyritic surfaces under 2 mm of water. Differentiation of nonoxidized and oxidized pyritic surfaces was possible with further separation of the spectra to show individual oxidation product peaks suggesting ferric hydroxide and ferric sulfate. (Author)

PB-198 527
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME VI. AIR POLLUTION IN RELATION TO CERTAIN ATMOSPHERIC AND METEOROLOGICAL CONDITIONS AND SOME OF THE METHODS EMPLOYED IN THE SURVEY AND ANALYSIS OF AIR POLLUTANTS,
M. Y. Nuttonson. 1971, 136p* APTD-0653
Contract PHS-AP-00786
See also Volume 5, PB-198 410.

Descriptors: (*Air pollution, *Atmospheric motion), (*USSR, Air pollution), (*Urban areas, Air pollution), Atmospheric diffusion, Meteorological data, Turbulence, Aerosols, Industrial wastes, Monitors, Statistical analysis, Diurnal variations, Climatology, Translations.

Contents:
- Propagation of atmospheric impurities under urban conditions;
- Dangerous conditions of pollution of the atmosphere by industrial discharges;
- Theory of the dependence between the concentration of aerosols in the atmosphere and their flow onto a horizontal board;
- Meteorological observations in the study of industrial pollution of the ground layer of air;
- Characteristics of thermal stability in the ground layer of air;
- Basic principles of organization of the survey of atmospheric pollution in cities;
- Organization and method of operation of atmospheric pollution observation posts;
- Use of statistical methods for the treatment of observational data on air pollution;
- AND Statistical analysis of data on air pollution in cities by means of natural functions.

PB-198 655
Manhattan Coll., Bronx, N.Y. Dept. of Civil Engineering.
THE BIOCHEMISTRY OF ANAEROBIC DIGESTION.
Final rept.,
John S. Jeris, Yi-shon Chen, Tse-Wen Chi, Yi-siung Su, and Cheng-nan Weng. Feb 70, 148p* W71-07136, EPA-WQO-17070-DFK-02/70

Descriptors: (*Anaerobic processes, *Metabolism), (*Sewage treatment, Anaerobic processes), (*Digestion (Decomposition), Anaerobic processes), Microorganisms, Methane, Biochemistry, Labeled substances, Lactic acid, Propionic acid, Succinic acid, Benzoic acids, Oleic acids, Digesters.

The investigation sought to determine by means of radioactive tracer techniques, the biochemical mechanisms in the anaerobic degradation of typical organics found in wastes. Two liter laboratory scale digesters were used in all the radioactive

tracer work. Substrate and nutrients were slug fed daily while carbon-14 compounds were slug fed one time or daily depending on the type of study being performed. Chemical analyses of the liquid feed and effluent were routinely performed along with identification of gaseous end products. Radioactivity analyses on the gases produced were conducted using liquid scintillation techniques. The degradation of propionic, succinic and lactic acids appear to be closely related with common intermediates. Propionic acids can be degraded through lactic or succinic acids and the reverse is true for each of the other two compounds. Propionic acid may also be metabolized by alpha or beta-oxidation giving rise to an intact methyl group in the methane formed, from either the number two or three carbon. A pathway for glutamic acid utilization was postulated involving the formation of two moles of acetic acid for each mole of substrate used. Oleic acid was primarily degraded by beta-oxidation. In the fermentation of benzoic acid, three moles of acetic acid were produced per mole degraded. (Author)

PB-198 699
Los Angeles County Air Pollution Control District, Calif.
STUDY OF JET AIRCRAFT EMISSIONS AND AIR QUALITY IN THE VICINITY OF THE LOS ANGELES INTERNATIONAL AIRPORT.
Apr 71, 190p* APTD-0662
Contract CPA-22-69-137

Descriptors: (*Air pollution, *Exhaust gases), (*Airports, Air pollution), (*Gas turbine engines, Air pollution), (*Aircraft cabins, Air pollution), Jet engines, Jet aircraft, Turbojet engines, Turbofan engines, Monitors, Gas sampling, Concentration (Composition), Particles.
Identifiers: *Jet engine exhaust, Los Angeles International Airport, *Indoor air pollution, *Air pollution detection.

The results of an investigation of the impact of jet aircraft operations on the air environment in the vicinity of a major air terminal are presented. The study, made at Los Angeles International Airport during the period of June 30, 1969, through November 18, 1970, had the following objectives: to determine total pollutant emissions from aircraft and ground operations at a major airport; to conduct exhaust measurements on the Pratt and Whitney JT4A and JT9D engines to complete the available exhaust emission data for gas turbine engines; to measure atmospheric concentrations of pollutants at ground level within and around a major airport; and, to determine the carbon monoxide exposure in an aircraft cabin during all ground operations. (APCO abstract)

PB-198 779
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
USER'S MANUAL AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES.
Final rept.,
H. S. Anderson, R. E. Paddock, R. O. Lyday, M. E. Fogel, and E. L. Hill. Dec 70, 297p* RTI-FR-OU-534-Vol-2 APTD-0665
Contract PHS-CPA-70-60
See also Volume 1, PB-197 647, and Volume 3, PB-198 780.

Descriptors: (*Air pollution, *Cost estimates), (*Air pollution control equipment, Cost estimates), (*Industrial waste treatment, Cost estimates), (*Programming manuals, Air pollution), Computer programs, Industrial wastes, Waste disposal, Electric power plants, Concrete plants, Coal preparation, Brick industry, Communication, Grains (Food), Metal industry, Foundaries, Iron and steel industry, Petroleum refining, Chemical industry, Paper industry, Oil storage.
Identifiers: *Air pollution control, Solid waste disposal.

A user's manual is presented which facilitates the use and modification of the computer programs developed within this research project for estimating the costs and emissions of specified industrial air pollution sources. The output from each source program consists of emission estimates, both before and after control, as well as required control costs on a plant by plant basis. The manual describes the input requirements, operational characteristics, and output characteristics for each program. (Author)

PB-198 780
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
SURVEY PLAN FOR SPECIFIED AIR POLLUTION SOURCES.
Final rept.,
M. E. Fogel, R. E. Folson, E. L. Hill, and F. A. Ayer. Dec 70, 50p* RTI-FR-OU-534-Vol-3 APTD-0664
Contract PHS-CPA-70-60
See also Volume 2, PB-198 779.

Descriptors: (*Air pollution, *Cost estimates), (*Air pollution control equipment, Cost estimates), (*Industrial waste treatment, Cost estimates), (*Economic surveys, Air pollution), Industrial wastes, Questionnaires, Brick industry, Coal preparation, Waste disposal, Calcium oxides, Petroleum refining, Oil storage, Rubber industry, Nonferrous castings, Sulfuric acid, Varnishes, Chemical industry, Metal industry, Metal industry, Grains (Food).
Identifiers: *Air pollution control.

A survey plan intended to increase the statistical validity of future Cost of Clean Air reports is presented. Eleven industrial sources are included in the sampling plan. These are: asphalt batching, brick and tile, coal cleaning, grain milling (animal feed only) and handling, lime, petroleum refining, petroleum storage, rubber (tires), secondary nonferrous, sulfuric acid, and varnish. Survey instruments are presented in Appendix I. Sampling design recommendations are presented for national, state and metropolitan area surveys. Recommendations for mail and follow-up procedures are also discussed. Finally, estimation techniques are presented. (Author)

PB-198 808
Monsanto Research Corp., Dayton, Ohio. Dayton Lab.
APPLICABILITY OF CATALYTIC OXIDATION TO THE DEVELOPMENT OF NEW PROCESSES FOR REMOVING SO2 FROM FLUE GASES. VOLUME I. LITERATURE REVIEW,
R. E. Opferkuch, S. M. Mehta, A. H. Konstam, D. L. Zanders, and H. R. Strop. Aug 70, 233p* MRC-DA-245-Vol-1 APTD-0675
Contract PH-22-68-12
See also Volume 2, PB-198 809.

Descriptors: (*Air pollution, Sulfur dioxide), (*Reviews, Air pollution control equipment), (*Sulfur dioxide, *Oxidation), (*Catalysts, *Air pollution control equipment), Platinum, Vanadium oxides, Magnesium oxides, Flue gases, Electric power plants, Cost engineering, Reaction kinetics, Sulfuric acid, Selenium, Adsorbents, Cost estimates, Economic analysis, Reviews.
Identifiers: *Air pollution control, Monsanto-Penelec process, Kiyoura-TIT process, Reinluft process, Mitsubishi process, Tyco process.

An extensive literature search for pertinent information relative to the catalytic oxidation of sulfur dioxide, is presented. The report also attempts to identify, describe, and evaluate processes disclosed in the literature to have commercial potential for removal of sulfur dioxide from flue gas by oxidation. (Author)

PB-198 809
Monsanto Research Corp., Dayton, Ohio. Dayton Lab.
APPLICABILITY OF CATALYTIC OXIDATION TO THE DEVELOPMENT OF NEW PROCESSES FOR REMOVING SO2 FROM FLUE GASES. VOLUME II. EXPERIMENTAL PROGRAM,
R. E. Opferkuch, S. M. Mehta, M. G. Konicek, and D. L. Zanders. Jan 71, 195p* MRC-DA-245-Vol-2 APTD-0676
Contract PH-22-68-12
See also PB-198 808, Volume 1, and Volume 3, PB-198 810.

Descriptors: (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, *Oxidation), (*Catalysts, *Air pollution control equipment), Chemical engineering, Flue gases, Electric power plants, Vanadium oxides, Platinum, Nitrogen dioxide, Cost engineering, Economic analysis, Cost estimates, Chemical reactors.
Identifiers: *Air pollution control, Tyce process.

During the first phase of the reported project, which covered the identification and evaluation of existing and potential methods of applying catalysis to the oxidation and removal of SO2 from power plant stack gas, a large quantity of information and data was accumulated and assessed. This evaluation revealed the need for laboratory verification of the published data on promising oxidation systems. The report presents subsequent data and information generated in the laboratory and on the drawing board.

PB-198 810
Monsanta Research Corp., Dayton, Ohio. Dayton Lab.
APPLICABILITY OF CATALYTIC OXIDATION TO THE DEVELOPMENT OF NEW PROCESSES FOR REMOVING SO2 FROM FLUE GASES. VOLUME III. INDEXED BIBLIOGRAPHY,
R. E. Opferkuch, S. M. Mehta, A. H. Konstam, D. L. Zanders, and H. R. Strop. Aug 70, 270p* MRC-DA-245-Vol-3 APTD-0677
Contract PH-22-68-12
See also Volume 2, PB-198 809.

Descriptors: (*Air pollution, Sulfur dioxide), (*Bibliographies, Air pollution control equipment), (*Catalysts, *Air pollution control equipment), (*Sulfur dioxide, *Oxidation), Indexes (Documentation), Chemical engineering, Vanadium oxides, Platinum, Magnesium oxides, Selenium, Nitrogen dioxide, Flue gases, Electric power plants.
Identifiers: *Air pollution control.

The report presents an indexed bibliography which provides access to all information accumulated during the literature search phase of this project. During the first phase, a search was made of all literature for pertinent information relating to the catalytic oxidation of sulfur dioxide. (Author)

PB-198 816
Minnesota Univ., Minneapolis. Particle Technology Lab.
AEROSOL MEASUREMENTS IN LOS ANGELES SMOG. VOLUME I,
K. T. Whitby. Feb 71, 153p* Pub-141 APTD-0630
Grant PHS-AP-00839

Descriptors: (*Air pollution, *Smog), Aerosols, California, Sampling, Chemical analysis, Monitors, Atmospheric condensation, Particle size, Turbidity, Condensation nuclei, Gas sampling, Urban areas.
Identifiers: *Los Angeles (California), *Air pollution detection.

A collaborative research study on the physical and chemical properties of Los Angeles smog aerosol was undertaken by a group of investigators. One of the prime goals of the study was to carry out a comprehensive, collaborative, effort, using a sufficient variety of chemical and aerosol measurement techniques on the same aerosol at the same place at the same time, so that a significant im-

provement in the correlations between various measurements could be made. The experiments were divided into the following main categories: (1) Measurement of the number versus size spectra measurements using the automated Minnesota Aerosol Analyzing System, (2) Sampling of the aerosol by lundgren impactor for mass and chemical composition versus size distribution, (3) Continuous gas analyzers, (4) Turbidimetric measurements, (5) Miscellaneous experiments including: cloud condensation and ice nuclei, samples for electron microscope and single particle chemicalanalysis, humidity effects, smog making in a bag, smog coagulation in a bag and particle beam experiments.

PB-198 817
Kellogg (M.W.) Co., Piscataway, N.J. Research and Engineering Development.
AVAILABILITY OF RESIDUAL FUEL OIL.
Final rept. Jun-Dec 70 on Task 2,
Charles J. Royce. 31 Dec 70, 100p* RED-70-1248
APTD-0668
Contract EPA-CPA-70-68

Descriptors: (*Fuel oil, Availability), (*Residual oils, Availability), (*Desulfurization, Fuel oil), (*Fuel consumption, Residual oils), Sulfur, Reserves, Petroleum refining, Cost estimates, Resources, International trade, Air pollution, Abatement, Production.
Identifiers: Air pollution control.

A final report of a study which was conducted with the objectives of estimating the present and future availability of residual fuel oil (RFO), relative to the U.S. Market, at current high sulfur levels and at low sulfur levels. The study consisted of two phases, as follows: Phase 1 - compilation of statistical data relating to the recent history of the crude oil and residual fuel oil situation throughout the world with particular emphasis on the United States. Phase 2 - Estimation of the present and future production capability of existing refineries, which are engaged in supplying the U.S. residual fuel oil requirements. Projection of the RFO production capabilities of these same refineries after the addition of hydrotreating facilities and the incremental cost of producing low sulfur RFO as a result of such modifications. (APCO abstract)

PB-198 821
Wisconsin Univ., Madison. Space Sciences Engineering Center.
STUDIES ON TECHNIQUES FOR SATELLITE SURVEILLANCE OF GLOBAL ATMOSPHERIC POLLUTION.
Final rept.,
Michael McClintock, T. A. Hariharan, and Alden McLellan IV. 30 Sep 70, 93p* APTD-0672
Contract PHS-CPA-22-69-101

Descriptors: (*Air pollution, *Space surveillance (Spaceborne)), (*Artificial satellites, Space surveillance (Spaceborne)), Monitors, Particles, Carbon monoxide, Turbidity, Aerosols, Lasers, Light scattering.
Identifiers: *Air pollution detection, *Remote sensing.

The report discusses research on the feasibility of using satellites to study air pollution. This is not an exhaustive analysis of ways in which satellites might be used for such studies, instead it is an initial survey of several areas that look promising. The following areas are discussed: Remote sensing of particulates; The possibility of calibrating the intensity of specularly reflected sunlight and using this optical source to measure the spectral turbidity of the atmosphere; Turbidity from ATS measurements; Techniques for remote sensing of gaseous air pollutants; Measurement of Co from the SMS Satellite and, the application of lasers to air pollution research. (APC abstract)

PB-198 822
Esso Research and Engineering Co., Linden, N.J. Government Research Div.
A REGENERATIVE LIMESTONE PROCESS FOR FLUIDIZED BED COAL COMBUSTION AND DESULFURIZATION.
Final rept.,
G. A. Hammons, and A. Skopp. 28 Feb 71, 122p*
APTD-0669
Contract EPA-CPA-70-19

Descriptors: (*Air pollution, *Combustion products), (*Coal, Air pollution), (*Adsorbents, *Limestone), (*Sulfur dioxide, *Adsorption), Furnaces, Fluidized bed processors, Particles, Flue gases, Desulfurization, Fly ash, Tests, Boilers, Injection, Regeneration (Engineering), Calcium oxides, Cost estimates.
Identifiers: *Air pollution control, *Waste gas recovery.

An experimental study was conducted on a fluidized bed coal combustion system using lime as a bed material. The lime reacts with SO2 and O to form CaSO4 under oxidizing conditions, thus reducing SO2 emissions. The reductive regeneration of the sulfated lime back to CaO2 and recycle of the regenerated lime back to the combustor was investigated as a method of reducing fresh limestone feed rates to the system. A three inch diameter combustor and a two inch diameter were utilized in this experimental program. (Author)

PB-199 058
Environmental Protection Agency, Research Triangle Park, N.C. Air Pollution Control Office.
ENVIRONMENTAL LEAD AND PUBLIC HEALTH.
R. E. Engel, D. I. Hammer, R. J. M. Horton, N. M. Lane, and L. A. Plumlee. Mar 71, 39p AP-90
Paper copy available from GPO $0.25 as EP4.9:90.

Descriptors: (*Lead poisoning, *Public health), (*Air pollution, Lead poisoning), (*Food contamination, Lead poisoning), (*Occupational diseases, Lead poisoning), Lead (Metal), Toxicology, Children, Diets, Metabolism, Paints, Residential buildings.

This document proposes to summarize briefly the major public health problems associated with lead in the environment. A basic discussion of lead metabolism and toxicology is presented, followed by sections on diet and consumer goods and on ambient air, all of which deal primarily with general population exposures. Because industrial workers and children constitute two distinct exposure groups, they are disconstitute two distinct exposure groups, they are discussed in separate sections. (APCO abstract)

PB-199 067
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
RENOVATION OF MUNICIPAL WASTEWATER BY REVERSE OSMOSIS.
Water pollution control research series,
John M. Smith, Arthur N. Masse, and Robert P. Miele. May 70, 66p W71-07756, FWQA-17040-05/70-May-70
Paper copy available from GPO $0.65 as EP2.10:17040-05/70.

Descriptors: (*Sewage treatment, *Water reclamation), (*Desalting, *Osmosis), (*Demineralizing, Osmosis), Membranes, Cellulose acetate, Tests, Water treatment, Particles, Cost estimates.
Identifiers: *Reverse osmosis desalination.

The three major configurations of reverse osmosis units include spiral wound units, tabular units, and plate and frame units. Tests were conducted on prototype units employing all three configurations, and the membranes were found capable of rejecting 93 to 95% of TDS, 90 to 99% of phosphates, 80 to 90% of ammonia nitrogen, 60 to 70% of nitrate nitrogen, 99 to 100% of particulate matter, 90 to 95% of TOC and greater than 90% of COD. Many of the problems discovered stemmed from the use of prototype units which had not been thoroughly tested and were subjected to repeated mechanical failures. Fouling problems have been partially alleviated by periodically depressurizing the membranes and washing them with enzyme detergents. The success of this method is attributed to protein hydrolysis of the slime layer which coats the membrane. Increasing population has dictated the recycling of a much larger portion of the nation's water. Each time it is re-used, the water picks up greater amounts of dissolved solids. These solids will eventually have to be removed to preserve the potability of drinking water. Also, increasing advances in membrane materials have steadily decreased the cost of reverse osmosis to the point that a reverse osmosis system coupled with primary and sand filtration only has an estimated cost of 35.4 cents/1000 gallons. (WRSIC abstract)

PB-199 068
Cincinnati Univ., Ohio. Environmental Health Engineering.
TREATMENT OF SOLE LEATHER VEGETABLE TANNERY WASTES.
Water pollution control research series,
J. David Eye. Sep 70, 120p W71-07758
FWQA,-12120-09/70
Paper copy available from GPO $1.25 as I67-13/4: 12120-09/70.

Descriptors: (*Water pollution, *Industrial wastes), (*Tanning materials, Water pollution), (*Industrial waste treatment, Tanning materials), Leather, Shoes, Lagoons (Ponds), Calcium oxides, Polyelectrolytes, Earthfills, Cost estimates, Clarification, Pilot plants, Biochemical oxygen demand.
Identifiers: *Water pollution control.

The basic objective of the studies was to find a technically feasible and economical procedure for treating the wastes from a sole weather vegetable tannery. A detailed identification of the sources of all wastes as well as a comprehensive characterization of each waste fraction was made. It was found that a large percentage of the pollutants initially were contained in a relatively small fraction of the total waste volume. The treatment scheme consisted of separation and pretreatment of the individual waste streams followed by mixing all waste streams for additional treatment in an anaerobic-aerobic lagoon system. The lime bearing wastes from the beamhouse were screened, treated with polyelectrolytes, and then clarified. The lime sludge was used for landfill. The system was designed to treat one million gallons of waste per week. BOD was reduced 85-95 percent and the suspended solids reduction was in excess of 95 percent. Installed cost of the total system was approximately $40,000 and it is estimated that the operating cost will be about $15,000 per year or 7 cents per hide processed. (Author)

PB-199 069
Johns-Manville Products Corp., Manville, N.J.
PHENOLIC WASTE REUSE BY DIATOMITE FILTRATION.
Water pollution control research series,
E. I. Merrill. Sep 70, 130p W71-07759,
FWQA-12080-EZF-09/70
Grant WPRD-87-01-68
Paper copy available from GPO $1.25 as I67.13/4:12080EZF09/0.

Descriptors: (*Water pollution, *Industrial wastes), (*Glass fibers, *Manufacturing), (*Phenolic resins, Water pollution), (*Glass industry, *Industrial waste treatment), Water reclamation, Filtration, Diatomaceous earth, Water filters, Cost estimates, Economic analysis, Water quality.
Identifiers: *Water pollution control.

Fiber glass production involves the use of an expensive phenolic resin. A 28 month study was conducted to determine the feasibility of reclaiming

waters which had been used for washing resins off of conveyor lines to prevent fouling. The system developed reduces water consumption by utilizing an 8 gpm, 1000 psi spray cleaner. After the conveyors are washed, the water flows through two stages of screening, or primary filtration, and a secondary diatomite filtration unit. Since most of the solids are large, the diatomite filters accomplish the removal of only .6% of the total solids load, with the major removals taking place at the pre-screening equipment. The water re-use system will use the same water 4.5 times before it is completely evaporated, requiring 1 lb of diatomite/500 gallons of water filtered. The system provides water at a net cost of $.37/1000 gallons as compared to $.75/1000 gallons for city water. Substantial operational savings have been realized through conservation of the expensive phenolic binder. Waste phenolic discharges have dropped 80%, suspended solids have decreased 85%, and dissolved solids have decreased by 50%. In this instance, therefore, waste discharge control has both protected the environment and profited the industry. (WRS abstract)

PB-199 071
FMC Corp., Santa Clara, Calif. Central Engineering Labs.
CANNERY WASTE TREATMENT KEHR ACTIVATED SLUDGE.
Water pollution control research series,
Robert A. Fisher. Sep 70, 70p W71-07757,
FWQA-12060-EZP-09/70
Paper copy available from GPO $0.70 - 167.13/4:12060-EZP-09/70.

Descriptors: (*Activated sludge process, *Industrial waste treatment), (*Sewage treatment, Activated sludge process), (*Canneries, Industrial waste treatment), Aeration, Biochemical oxygen demand, Particles, Tests.
Identifiers: *Kerr activated sludge process.

The Kehr modification of the activated sludge process (KASP) uses completely mixed aeration tank with no intentional solids wasting. After the aeration tank stabilized at between 4000 and 12,000 mg/l of MLSS, a 40 day investigation using municipal and cannery wastes of strengths from 200 to 2000 mg/l BOD5 was conducted. 90% BOD5 and 80% TOC reductions were achieved, but little or no reduction was detected in nitrates and phosphates and the effluent was colored and turbid. Periods of little or no loading for as long as 48 hours caused no decrease in treatment efficiency when flow was resumed. From the above information, KASP was recognized as being well suited to industrial waste pre-treatment prior to discharge to a municipal treatment plant. The ability to handle intermittent flows provide 90% BOD5 removal, and provide aerobic digestion of solids in the aeration tank is essential for pre-treatment devices and all are possessed by KASP. Exclusive of primarytreatment, treatment of 10 mgd of a 250 mg/l BOD5 waste would cost 7 cents/1000 gallons using gravity settling. (Author)

PB-199 072
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
TREATMENT TECHNIQUES FOR REMOVING PHOSPHORUS FROM MUNICIPAL WASTEWATERS.
Water pollution control research series,
John J. Convery. 29 Jan 70, 44p W71-07760
FWQA,-17010-01/70
Paper copy available form GPO $0.50 as EP2.10:17010-01/70.

Descriptors: (*Water pollution, Phosphates), (*Sewage treatment, Phosphates), (*Chemical removal (Sewage treatment), *Phosphates), Precipitation (Chemistry), Coagulation, Sedimentation, Calcium oxides, Neutralizing, Cost estimates, Feasibility, Particles.
Identifiers: *Water pollution control.

Biological uptake, chemical precipitation of soluble phosphorus, and settling or filtration of particulate phosphorus are the major removal mechanisms used in phosphorus removal. At present, chemical precipitation is the most universally applied method. The wide variety of chemical reactions which lead to phosphorus precipitation allows much flexibility of operation to plant operators. In dealing with raw sewage, primary effluent, or secondary effluent the size of the plant, influent waste water characteristics phosphorus discharge standard, and the types of other processes used in the treatment train must all be considered. In addition to phosphorus removal, higher levels of BOD and suspended solids removals are customarily are customarily obtained when some type of phosphate reduction mechanism is employed. Each of the mechanisms described here have been analyzed both with respect to technological and economic feasibility. Costs ranged from 13 cents/1000 gallons for two-stage lime treatment of 1 mgd to achieve 97% removal, to a potential low of $.015/1000 gallons using waste pickle liquor to achieve a reduction of 80%. (WRSIC - abstract)

PB-199 160
ureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
ELECTROMAGNETIC RADIATION INTERFERENCE WITH CARDIAC PACEMAKERS,
Paul S. Ruggera, and Robert L. Elder. Apr 71, 38p* BRH/DEP-71-5
Paper copy available from GPO $0.45.

Descriptors: (*Medical equipment, *Radiofrequency interference), (*Microwaves, Radiation hazards), Hearts, Cardiac arrest, Radiation damage, Motors, Stoves.
Identifiers: *Cardiac pacemakers, *Electromagnetic radiation hazards, *Microwave radiation leakage, *Microwave ovens.

A study was initiated to determine the relative danger presented to cardiac pacemaker patients by the microwave oven in comparison with other known sources of electromagnetic interference. This report explains how pacemakers and microwave ovens function, describes the mechanism of electromagnetic interference, and outlines the status of Division of Electronic Products activities' in this area. (Author)

PB-199 181
Environmental Protection Agency. Research Triangle Park, N.C. Air Pollution Control Office.
MOUNT STORM, WEST VIRGINIA - GORMAN, MARYLAND, AND LUKE, MARYLAND - KEYSER, WEST VIRGINIA, AIR POLLUTION ABATEMENT ACTIVITY.

Apr 71, 146p* APTD-0656

Descriptors: (*Air pollution, *Combustion products), (*Electric power plants, Air pollution), (*West Virginia, Air pollution), (*Maryland, Air pollution), (*Sulfur dioxide, Air pollution), Trees (Plants), Ornamental trees, Particles, Atmospheric motion, Meteorological data, Pulp mills, Coal preparation, Urban areas, Hydrogen sulfide, Public health, Nitrogen oxides, Oxidants.
Identifiers: *Air pollution effects (Plants), Mount Storm Power Plant, *Mount Storm (West Virginia), *Gorman (Maryland), *Luke (Maryland), *Keyser (West Virginia), *Christmas tree industry.

A report based upon an investigation of air pollution conducted the Mt. Storm, West Virginia, - Gorman, Maryland, and Luke, Maryland - Keyser, West Virginia areas in 1969 and 1970, is presented. The report has been divided into two parts. Part One is concerned primarily with the Mt. Storm, West Virginia - Gorman, Maryland, area where air-pollution related damage to commercial tree growing operations has been cited as a major problem. Part Two deals wih air pollution problems in the Luke, Maryland - Keyser, West Virginia, area caused by particulates matter and noxious sulfur gases released from industrial plants in the area. (APCO abstract)

PB-199 269
Oklahoma Univ., Norman. Bureau of Water Resources Research.
DEMONSTRATING THE EFFECTS OF NUTRIENTS IN BIO-OXIDATION POND RECEIVING STREAMS,
George W. Reid, Leale E. Streebin, and Oliver T. Love, Jr. Mar 71, 83p W71-07973 EPA-WQO,-16010-03/71
Grant WPD98-01-66

Descriptors: (*Biochemical oxygen demand, Lagoons (Ponds)), (*Food chains, Degradation), (*Water pollution, Lagoons (Ponds)), Streams, Algae, Plankton, Biochemistry, Sewage, Waste water, Water treatment.
Identifiers: *Eutrophication.

This study considered the receiving stream as an integral part of the bio-oxidation pond method of treatment with the objective being to provide a better understanding of the bio-oxidation pond - receiving stream system. As representative of this 'real world' situation with all of its variables, five existing central Oklahoma bio-oxidation ponds which had diverse loadings and designs were utilized. By observing these systems under varying climatic conditions, the effects of the bio-oxidation pond nutrients along with other pollutional parameters which were discharged into intermittent receiving streams were evaluated. Except for scouring, bio-oxidation ponds and bio-oxidation pond - receiving streams were found to behave essentially the same as the streams became a continuation of the pond. In addition to making biochemical adjustments, the streams lost much of their biological identity and assumed characteristics more closely associated with the biological loadings from the pond effluent. The most persistent algae in the systems were the flagellates (Euglenophyta) and the blue-green algae (Cyanophyta) as these plankters had little difficulty making the transition from their acclimated life in the pond to the stream. (WRSIC abstract))

PB-199 295
BISRA-The Corporate Labs. of the British Steel Corp., London (England). Strip Mills Div.
BIBLIOGRAPHY OF PUBLISHED LITERATURE ON ASPECTS OF PHYSICAL QUALITY OF HOT ROLLED STEEL STRIP (1960 TO 1970),
D. Brinn. 1971, 21p BISRA-SM/TN/1/5

Descriptors: (*Steels, Metal strip), Bibliographies, Hot rolling, Surface properties, Dimensions, Dimensional measurement, Tolerances (Mechanics), Measuring instruments, Great Britain.

Contents:
- Surface defects and quality;
- Gauge variation;
- Strip shape;
- Strip profile;
- Width variations;
- Edges;
- Coil characteristics;
- General aspects;
- Some references on width gauges for hot strip mills;
- Some references on thickness gauges for hot strip mills;
- Some references on inspection equipment in general for hot strip mills.

PB-199 332
Development Sciences, Inc., East Sandwich, Mass.
ATECHNIQUE FOR THE SYSTEMATIC IDENTIFICATION OF POLLUTION RFEDUCTION MEASURES: EMIS
Final rept.

10 Nov 70, 95p* APTD-0616

Descriptors: (*Pollution, Environmental surveys), (*Air pollution, *Information systems), (*Water pollution, Information systems), (*Economic surveys, Pollution), Computer programs, Conflict, Economic conditions, Land use, Industries, Regional planning, Government policies, Cost estimates.
Identifiers: *Ecosystem of Machines Information System, EMIS (Ecosystem of Machines Information System).

The report attempts to reveal the alternatives available to government and to private industry as they cope with the conflict of economic growth and pollution abatement. In relating the multifaceted approaches to the problem, the report has two purposes: To minimize the conflict between economic growth and pollution abatement by examining opportunities which are often overlooked; To create an information system which clearly identifies the empirical possibilities available within the pollution abatement strategies considered. This approach, which is called, Ecosystem of Machines Information System (EMIS), suggests a way of determining the minimum data needed by integrating data sets with abatement strategy; a way to maximize useful information by collecting data in the context of its use, and a systematic way to judge alternative approaches for particular industries in a decentralized economy. Presented is the design for the systematic identification of potential matches of industries, listing the basic computer routines. A sample data base is indicated and processed through the alternative strategies for abatement. The present practices of abatement policy are investigated and opportunities through the EMIS method are suggested. Twelve reasons why this approach will not work and 12 requirements which are raised by these objectives. (Author)

PB-199 361
Federal Water Pollution Control Administration, Washington, D.C. Div. of Applied Science and Technology.
COMBINED SEWER OVERFLOW SEMINAR PAPERS.
Water pollution control research series.

Mar 70, 199p FWPCA-DAST-37 W71-07978 EPA,-11020--03/70

Descriptors: (*Water pollution, *Sewage), (*Combined sewers, Water pollution), (*Sewage treatment, Combined sewers), (*Meetings, Combined sewers), Storm sewers, Water flow, Flow control. Fluid filters, District of Columbia, Assessment, Massachusetts, Surface water runoff, Water quality, Ozonization, Chlorination, Flotation.
Identifiers: *Water pollution control, Boston (Massachusetts).

Contents:
- Storage and treatment of combined sewage as an alternate to separation;
- Polymers for sewer flow control;
- Microstraining - with ozonation or chlorination - of combined sewer overflows;
- The use of screening/dissolved-air flotation for treating combined sewer overflow;
- Assessment of alternative methods for control/treatment of combined sewer overflows for Washington, D.C.;
- A simulation technique for assessing storm and combined sewer systems;
- Building for the future - the Boston Deep Tunnel Plan.

PB-199 362
Envirogenics Co., El Monte, Calif.
NEW TECHNOLOGY FOR TREATMENT OF WASTEWATER BY REVERSE OSMOSIS.

Sep 70, 77p W71-07990 EPA-WQO,-17020-DUD-09/70
Contract EPA-WQO-14-12-553
Paper copy available from GPO $0.70 as EP2.10:17020DUD09/70.

Descriptors: (*Sewage treatment, *Osmosis), (*Membranes, Osmosis), (*Demineralizing, Membranes), (*Cellulosic resins, Membranes), Fabrication, Desalting, Cleaning, Flux (Rate), Fouling, Dissolved gases, Ammonium compounds, Particles, Cellulose acetate, Colloids, Succinates, Fluid flow, Sulfates, Enzymes, Casting, Semi permeability.
Identifiers: *Reverse osmosis.

Stable, high-flux membranes for wastewater renovation by reverse osmosis were required to meet or exceed: fluxes greater than 60 gal/sq ft/day with no more than a 20% increase after one year; Rejection of 60% of sodium chloride; and Rejection of 90% of sodium sulfate. All testing was performed at 600 psi, with 1000 ppm feed solutions. These specifications were met by three cellulose based membranes. Flux losses over short periods were extrapolated to yearly values and ranged from 12-18%. However, periodic cleaning with a laundry enzyme pre-soak was necessary as the flux rates initially declined very rapidly. Cleaning restored the membranes to 80 to 90% of the initial values. Daily cleaning maintained a five day series of tests at nearly constant levels. The best of the three membranes tested rejected 90 to 97% of TDS, 70 to 100% of COD, 86 to 96% of ammonium ion, 72 to 99% of nitrate ion, and 97 to 99% of total phosphate. Techniques were explored for attachment of proteolytic enzymes to cellulose acetate membranes to render them resistant to colloid fouling. The proteolytic enzyme trypsin was chemically attached to the active layer surface of a membrane prepared from the N-hydroxysuccinimide ester of cellulose acetate hydrogen succinate. The resulting enzymatic membrane displayed hydrolytic activity. No cost estimates were presented for this type of treatment process. (WRSIC abstract)

PB-199 363
Baltimore City, Md.
PHOSPHATE STUDY AT THE BALTIMORE BACK RIVER WASTE-WATER TREATMENT PLANT.

Sep 70, 164p W71-07[illegible] WQO,-17010-DFV-09/70
Contract EPA-WQO-14-12-147
Paper copy available from GPO $1.50 as EP2.10:17010/DFV09-70.

Descriptors: (*Sewage treatment, Activated sludge treatment), (*Chemical removal (Sewage treatment), *Phosphates), (*Activated sludge treatment, Phosphates), Dissolved gases, Oxygen, Environments, Aeration, Calcium, Precipitation (Chemistry), Particles, Diurnal variations, Sanitary engineering, Effectiveness.
Identifiers: *Water pollution control.

High levels of phosphorus removal have been observed at the Baltimore Sewage Plant in the past. A six month study of the operating conditions and design parameters of tow parallel, 10 MGD activated sludge systems was conducted in an attempt to establish the mechanism by which the phosphate was removed. The following variables were used: suspended solids concentration, waste water flow, aeration basin mixing configuration, and dissolved oxygen levels. Both mixing and dissolved oxygen were shown to influence the process greatly. Contact stabilization or step aeration, as opposed to plug flow, caused sharp decreases in the removals, while low dissolved oxygen levels stimulated releases of phosphorus from the sludge. Operating conditions which enhance phosphate removal are standard conditions now at the Baltimore plant. Phosphate removal at Baltimore average 82%, compared with 15 to 20% removals for conventional activated sludge, and 9% in Baltimore's trickling filter. No cost analysis was undertaken, wince complete removal of the phosphorus involves removal from the sludge supernatant. Some of the parameters which may lead to enhanced phosphate removals have been demonstrated. However, the exact reaction or mechanism by which the removals proceed is still unknown, even though it was established that the calcium removed from the system was not principally by precipitation. (WRSIC abstract)

PB-199 364
Minnesota Univ., Minneapolis. St. Anthony Falls Hydraulic Lab.
TEMPERATURE CONTROL IN OUTDOOR EXPERIMENTAL PONDS.
Project rept.,
H. Stefan, E. Silberman, P. Vaidyaraman, and W. Geiger. Dec 70, 137p 116 W71-06093, FWQA-18050-EUJ-12/70

Descriptors: (*Ponds, *Temperature control), (*Aquatic plants, Ecology), (*Electric power plants, Water pollution), Feasibility, Cooling, Model basins, Design, Thermal properties, Heat transfer.
Identifiers: Thermal pollution.

A system of outdoor experimental ponds for the study of aquatic life under the effect of various controlled water temperatures has been designed. The ponds were to be located near power plants in Minnesota. The purpose of the study is to determine the feasiblity of maintaining certain specified temperature regimes in the proposed ponds. This was done by considering the available heating and cooling capacity and the environmental conditions prevailing at the selected site and making design calculations for the major elements of the system. Firstly, the limits of feasible temperature control were determined. Secondly, heating and cooling systems were devised and thirdly, a method of control was developed. For cooling, use of the well water is proposed, and, for heating, the water released from the thermal power station is going to be used. External and internal heat exchange systems were examined and both were found to be feasible and adequate. The study has the character of a feasibility study. (WRSIC abstract)

PB-199 412
Sperry Rand Research Center, Sudbury, Mass.
THREE RADIOMETRIC DATA ANALYSIS TECHNIQUES FOR MEASURING AIR TEMPERATURE PROFILES.
Final rept. 23 Jun 69-23 Oct 70,
W. D. Mount, B. R. Fow, C. V. Wick, and C. M. Maloy. 23 Oct 70, 111p SRRC-CR-70-27 APTD-0673
Contract CPA-22-69-116

Descriptors: (*Radiometers, Data processing), (*Temperature inversions, Mathematical models), Statistical analysis, Thickness, Atmospheric physics, Temperature, Remote sensing.
Identifiers: Radiometric thermasondes.

The problem of determining the height of the base, the intensity and the thickness of an elevated inversion layer from radiometric thermasonde data is discussed. Three advanced radiometric data analysis techniques emphasizing the detection and measurement of these salient features of elevated inversions are proposed. The techniques include: (1) a statistical procedure for finding the best three-straight-line representation of the true profile from the radiometric data--called the gradient altitude model, (2) a relaxation procedure for finding the ambient temperature at sixteen preselected heights from the surface to 2.54 km, and (3) several analog and empirical techniques for detecting the presence and determining the base heights and other features of an elevated inversion directly from the recorder outputs of thermasonde data. The initial development and evaluation of these techniques using simulated and real data are presented. The results show that the problem of determining the features of an elevated inversion becomes more difficult as the height of its base in-

creases, its intensity decreases, and its thickness decreases. The relaxation technique appears to be capable of providing accurate descriptions of the temperature profile in the case of elevated inversions of up to 5. (Author)

PB-199 427
Sperry Rand Corp., Clearwater, Fla. Sperry Microwave Electronics Div.
RADIOMETRIC THERMACONDE (TRADEMARK) PROGRAM.
Final rept. 15 May 69-15 Feb 71,
T. J. Lemmons. 15 Feb 71, 70p SJ-232-6062-15
APTD-0674
Contract CPA-22-69-93

Descriptors: (*Radiometers, *Air pollution), Microwave equipment, Thermal measuring instruments.
Identifiers: *Microwave radiometers, *Air pollution detection.

The report is a summary of contract requirements and work performed on the Radiometric THERMASONDE Program. Included are equipment specifications, requirements and block diagrams of the MK II THERMASONDE. Details of some work are included in this report as are references to other reports on this contract and associated reports from other sources. The work culminated in a MK II THERMASONDE configuration with many critical design details completed and recommendations for continuing development effort. (Author)

PB-199 428
Grace (W.R.) and Co., Baltimore, Md. Davison Chemical Div.
DEVELOPMENT OF IMPROVED ALKALIZED ALUMINA FOR SO2 CONTROL.
Final rept. 15 Jun 67-15 Sep 69,
W. S. Briggs, E. Eichhorn, and P. K. Maher. Sep 69, 88p* APTD-0670
Contract PH-86-67-129

Descriptors: (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, *Adsorption), (*Adsorbents, *Aluminates), (*Regeneration (Engineering), Adsorbents), Pilot plants, Operating costs, Cost estimates, Chemical engineering, Field tests, Recovery, Carbon dioxide, Binders.
Identifiers: *Sodium aluminates, *Waste gas recovery, *Air pollution control.

A final, summary report of studies on the use of activated alkalized alumina for the removal of SO2 from flue gases. Investigation of this process in the laboratory and pilot plant resulted in the following questions regarding the performance characteristics, method and cost of manufacture of alkalized alumina: Maximization of sorption rate and capacity; Maximization of regeneration rate; Minimization of regeneration cost with regard to temperature and reducing gas used; Improving of attrition resistance of the sorbent; Development of a low cost manufacturing procedure. These questions are also the objectives of the program. (Author)

PB-199 479
Massachusetts Inst. of Tech., Cambridge.
CLEAN AIR CAR RACE - 1970.
Summary rept.

Feb 71, 279p* APTD-0680
Contract EPA-CPA-70-169

Descriptors: (*Air pollution, *Exhaust gases), (*Automobile engines, Air pollution), (*Air pollution control equipment, Automobile engines), Automotive fuels, Rankine cycle, Brayton cycle, Electric vehicles, Gas turbine engines, Economic analysis, Spark ignition engines, Liquefied natural gas, Methanols, Antiknock additives, Diesel fuels, Kerosene, Standards, Design.
Identifiers: *Clean Air Car Race 1970, *Automobile exhaust, Hybrid vehicular propulsion, Catalytic reactors (Exhaust system), Thermal reactors (Exhaust systems).

A summary report of the 1970 Clean Air Car Race (CACR) is presented. The report begins with a brief discussion of sources and health effects of air pollution and of current control procedures for internal engine combustion exhaust. A synopsis of events leading to the CACR, and a summary of achievements and impacts of the race are presented. The report includes a discussion of the winners of the CACR; the classification of their vehicle power plants, selection procedure for the winners and other pertinent facts about the class winners and the overall winner. The performance test procedures for CACR vehicles are outlined, followed by a detailed discussion of the exhaust emission standards and CACR test procedures. The report also includes a discussion of the automotive fuel used in the race and the actual costs of the race. (Author)

PB-199 707
Washington Univ., Seattle. Dept. of Civil Engineering.
CHEMICAL CHARACTERISTICS OF ORGANIC COLOR IN WATER.
Final rept.,
Russell f. Cristman, Mesahisa Nakamura, and Warren Williams. Sep 70, 95p W71-08396, FWQA-16020-DKW-09/70

Descriptors: (*Water pollution, *Colors (Materials)), (*Chemical removal (Water treatment), Colors (Materials)), (*Coagulation, Chemical removal (Water treatment)), Precipitation (Chemistry), Colloids, pH, Organic compounds, Aluminum inorganic compounds, Thorium inorganic compounds, Lanthanum compounds, Computer programs, Carbon, Electrochemistry, Chemical equilibrium, Adsorption.

The colloid charge titration technique described by Kawamura and Tanaka, was used to measure the charge on color-aluminum, color-thorium, and color-lanthanum dispersions. This method was able to measure the charge on colloids which were too small to be seen, thus replacing the Briggs microelectrophoresis cell technique. Tests were conducted using a Lumetron Model 402E filter photometer to obtain data points of pH vs % transmission; and pH vs total organic carbon. A computer program was designed to perform a least squares analysis on all the data points to determine the shape of the curve, and the curves were then plotted on a plotter. The program which was developed will analyze as many as 15 sets of data. Analyses made on data taken from actual colored influent will provide operators with plots which show the optimum operating conditions for a particular color removal problem. (WRSIC abstract) (Lowry-Texas)

PB-199 709
Federal Water Quality Administration, Washington, D.C.
NATIONAL SYMPOSIUM ON FOOD PROCESSING WASTES PROCEEDINGS (1ST), HELD AT PORTLAND, OREGON ON 6-8 APRIL 1970.
Water pollution control research series.
Apr 70, 400p W71-08398, FWQA-12060-04/70
Paper copy available from GPO $3.00 as I67.13/4:12060-04/70.

Descriptors: (*Water pollution, *Industrial wastes), (*Food processing, Water pollution), (*Industrial waste treatment, Food processing), Meetings, Water quality, Potatoes, Fruits, Tomatoes, Sugarbeets, Seafood, Vegetables, Activated sludge treatment, Fungi, Sewage treatment, Agricultural wastes, Economic analysis, Canneries, Rice, Utilization, Waste disposal, Feeding stuffs, Trickling filtration, Airation.
Identifiers: *Water pollution control, *Water pollution control equipment, Potatoe processing, Beet processing.

Some of the topics reported and discussed include the following: Aerobic secondary treatment of potato processing wastes; Use of fungi imperfecti in waste control; Combined treatment of domestic and industrial wastes by activated sludge; Aerobic treatment of liquid fruit processing waste; Cannery waste treatment by two-stage aeration process; Lime treatment and in-plant reuse of an activated sludge plant effluent in the citrus processing industry; Seafoods processing; Cannery waste treatment by a high solids activated sludge process; Concentration of sugarbeet wastes for economic treatment with biological systems; Reconditioning and reuse of olive processing brines; Trickling filter treatment of food canning waste water; Wurdd's task force on agricultural pollution; In-field processing of tomatoes; 'Dry' caustic peeling of vegetables and fruits; Pilot plant experience of USDA-Magnuson dry caustic peeling process; Possible uses of uni-flow filter; Animal feeds from vegetable wastes; Rice hull utilization.

PB-199 795
Karolinska Institutet, Stockholm (Sweden). Dept. of Environmental Hygiene.
CADMIUM IN THE ENVIRONMENT. A TOXICOLOGICAL AND EPIDEMIOLOGICAL APPRAISAL,
Lars Friberg, Magnus Piscator, and Gunnar Nordberg. Apr 71, 353p* APTD-0681
Contract CPA-70-30

Descriptors: (*Water pollution, Cadmium), (*Air pollution, Cadmium), (*Cadmium, *Toxicology), (*Public health, Cadmium), Exposure, Industrial wastes, Metabolism, Metabolic diseases, Respiratory system, Gastrointestinal system, Musculoskeletal disorders, Hematopoiesis, Liver, Genetics, Carcinogens, Dosage, Testis.
Identifiers: *Air pollution effects (Animals), Air pollution effects (Humans), Water pollution effects (Animals), Itai itai disease.

A review on cadmium is presented which focuses on information essential to the understanding of the toxic action of cadmium and the relationship between dose (exposure) and effects on human beings and animals. The following areas are covered in this presentation: Occurrence of cadmium possible routes of exposure and daily intake; metabolism of cadmium; respiratory effects and dose-response relationships; systemic effects and dose-response relationships; carcinogenic and genetic effects; the Itai-Itai disease. (APTD Abstract)

PB-199 828
Iowa State Univ., Ames.
AGRICULTURAL PRACTICES AND WATER QUALITY. PROCEEDINGS OF A CONFERENCE CONCERNING THE ROLE OF AGRICULTURE IN CLEAN WATER, NOVEMBER 1969.

Nov 70, 434p* EPA-DAST-26 W71-05437, EPA-WQO-13040-EYX-11/69

Descriptors: (*Agricultural engineering, *Water pollution), (*Symposia, Water pollution), (*Suspended sediments, Water pollution), (*Nutrients, Water pollution), (*Pesticides, Water pollution), (*Agricultural wastes, Water pollution), Fertilizers, Nitrates, Phosphates, Insecticides, Livestock, Ground water, Recreational facilities, Surface water runoff, Sewage treatment, Law (Jurisprudence), Economic analysis, Water quality.
Identifiers: Water pollution control, Manure.

The report is a result of a conference, the Role of Agriculture in Clean Water, held at Iowa State University, Ames, Iowa, November 18-20, 1969.

Categories include: Sediment as a Water Pollutant, Plant Nutrients as Water Pollutants, Pesticides as Water Pollutants, Animal Wastes as Water Pollutants, Agricultural Pollution Implications, and Agriculture's Involvement in Polluted and Clean Water. (WRSIC abstract)

PB-199 834
Clemson Univ., S.C. Dept. of Environmental Systems Engineering.
CHARACTERISTICS AND KINETICS OF BIOLOGICAL FIXED FILM REACTORS,
Billy H. Kornegay, and John F. Andrews. 1970, 227p* W71-08423, FWPCA-17050-00/70
Grant FWPCA-WP-01181

Descriptors: (*Trickling filtration, *Mathematical models), (*Trickling filters, Design criteria), (*Sewage treatment, Trickling filtration), Films, Kinetics, Mixing, Diffusion, Microorganisms, Industrial waste treatment, Dissolved gases, Substrates, Bacteria, Fluid flow.

The kinetics of biological slime films were investigated using six completely mixed, annular reactors. Design criteria for trickling filters were formerly based on experience and guesswork, so this investigation attempted to determine the kinetics of a simple system to provide a better basis for establishing trickling filter design criteria. A simple glucose and mineral base substrate was fed to microorganisms attached to the walls of the 6 annular, completely mixed reactors. The reactors were operated first in parallel, for a basic investigation of biological film kinetics, and second, in series, to approximate plug flow. Completely mixed reactors eliminated channeling, dissolved oxygen and substrate gradients, and the interdependence of velocity and flow. Film development was uniform, and liquid channeling did not occur. This investigation revealed that biological films develop in three distinct stages: (1) logarithmic growth which lasted until the active thickness was reached; (2) linear growth, between the active thickness and the plateau thickness and (3) zero growth, as all new cells are washed away. The active film thickness averaged 70 and was independent of D.O. Kinetic equations were developed which showed good correlation between theoretical and observed data. On this basis, a trickling filter design equation, based on the kinetics of the process, was developed. (WRSIC abstract)

PB-199 835
Ohio State Univ. Research Foundation, Columbus.
ACID MINE DRAINAGE FORMATION AND ABATEMENT.
Water Pollution Control Research series.
Apr 71, 89p* EPA-DAST-42 W71-08591, EPA-14010-FPR-04/71
EPA

Descriptors: (*Water pollution, *Mine waters), (*Pyrite, Mine waters), Oxidation, Mathematical models, Spoil, Mining, Chemical reactions, Microorganisms, Ferrobacillus, Thiobacillus, Oxidation reduction reactions, Iron, Sulfides.
Identifiers: *Mine acid drainage, *Water pollution control.

The report pertains to at-source control of pyrite oxidation. The current level of knowledge of acid mine drainage formation is critically reviewed, with emphasis on reaction kinetics and reactant and product transport. A reaction system model is developed which provides a conceptual framework for subsequent discussion dealing specifically with the physical, chemical, and biological characteristics of pyritic systems encountered in mining situations. Practical considerations of at-source control of acid mine drainage formation in underground mines, spoil banks, and refuse piles are presented. Deficiencies in current knowledge include: Descriptions of the physical environment existing at pyrite oxidation sites in natural systems are far more incomplete that the current understanding of pyrite oxidation kinetics; Oxygen transport is poorly described at this time but is probably the rate-controlling factor in most instances; Serious questions exist as to the effectiveness of air-sealing techniques as currently practiced; The significance of bacterial catalysis of pyrite oxidation under field conditions has not been established. (Author)

PB-199 903
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Toxicology.
GUIDES FOR SHORT-TERM EXPOSURES OF THE PUBLIC TO AIR POLLUTANTS. I. GUIDE FOR OXIDES OF NITROGEN.

1 Apr 71, 33p* APTD-0667
Contract CPA-70-57

Descriptors: (*Air pollution, *Public health), (*Nitrogen oxides, Air pollution), (*Toxicology, Nitrogen oxides), (*Respiratory diseases, *Nitrogen dioxide), Nitrogen oxide (NO), Exposure, Standards, Temperature, Age, Heredity, Physiology, Microorganisms, Instructions, Humans, Reviews.
Identifiers: *Air pollution effects (Animals), Nitrogen oxide (N2O5), Air pollution public emergency limits.

Guides for brief, intermittent exposure to nitrogen oxides have been compiled and presented. The oxides of greatest concern are nitric oxide, nitrogen dioxide and nitrogen pentoxide. Toxicological data is presented on these. Factors and conditions that can, modify and significantly alter human response to nitrogen dioxide are discussed. The most important ones are; temperature, predisposing disease, heredity, age and, interactions to other environmental pollutants. Values for short term exposure to NOx are tabulated. Experimental data on humans and laboratory animals exposed to NO2 are included in the appendices. (APCO abstract)

PB-199 904
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Toxicology.
BASIS FOR ESTABLISHING GUIDES FOR SHORT-TERM EXPOSURES OF THE PUBLIC TO AIR POLLUTANTS.

May 71, 16p* APTD-0684
Contract CPA-70-57

Descriptors: (*Air pollution, *Public health), (*Toxicology, Air pollution), Instructions, Standards, Exposure, Humans, Epidemiology.
Identifiers: *Air pollution effects (Animals), *Air pollution effects (Plants), Air pollution public emergency limits.

The basic rationale used in the preparation of a series of guides for short-term exposure to air pollutants are presented. The assumptions underlying guide preparation are given. The factors and considerations in guide preparation are outlined. The evaluation of the relationship between exposure to a pollutant and its effect on the population are discussed. Also included is a discussion of the selection of short-term Public Limits and Public Emergency Limits. (APCO abstract)

PB-200 071
Princeton Chemical Research, Inc., N.J.
REMOVAL OF SULFUR DIOXIDE FROM WASTE GASES BY REDUCTION TO ELEMENTAL SULFUR.
Final rept. 19 Oct 67-30 Jul 69.

30 Jul 69, 301p* APTD-0682
Contract PH-86-68-48

Descriptors: (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, *Reduction (Chemistry)), (*Catalysts, Sulfur dioxide), Reviews, Flue gases, Hydrogen sulfide, Pilot plants, Cost estimates, Design criteria, Aluminum oxides, Bauxite, Aluminates, Sulfur, Smelters, Concentration (Composition), Regeneration (Engineering), Methane, Water vapor, Reaction kinetics.
Identifiers: *Air pollution control, *Claus process, Molecular series, *Waste gas recovery.

A novel process for the removal of sulfur dioxide from waste gases is described. In this process, SO2 is directly reduced to elemental sulfur by hydrogen sulfide which is in turn generated by reducing part of the elemental sulfur with natural gas. The objectives of the study made on this process are as follows: to demonstrate the feasibility of each process step; to construct and operate an integrated pilot plant using a real flue gas; and to develop design and economic data for full scale application to various waste gas streams. (APCO abstract)

PB-200 078
Environmental Protection Agency, Research Triangle Park, N.C. Air Pollution Control Office.
AIR POLLUTION ASPECTS OF EMISSION SOURCES: MUNICIPAL INCINERATION. A BIBLIOGRAPHY WITH ABSTRACTS.

May 71, 101p AP-92
Paper copy available from GPO $1.00 as EP 4.9:92, SOD 5503-0005.

Descriptors: (*Air pollution, *Combustion products), (*Incinerators, Air pollution), (*Bibliographies, Air pollution), (*Air pollution control equipment, Incinerators), Abstracts, Public health, Waste disposal, Standards, Economic analysis, Law (Jurisprudence), Attitude surveys, Atmospheric corrosion.
Identifiers: Air pollution control, Air pollution detection, *Solid waste disposal, Air pollution effects (Materials), Air pollution effects (Animals), Air pollution effects (Plants).

A compilation of approximately 320 technical abstracts dealing with air pollution aspects municipal incineration is presented in this bibliography. The abstracts relate to the following categories: emission sources, control methods, measurement methods, air quality measurements, basic science and technology, effects-human health, effects-plants and livestock, effects - materials, effects - economic standards and criteria, legal and administrative, and social aspects. (APCO abstract)

PB-200 079
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
AIR POLLUTION ASPECTS OF EMISSION SOURCES: SULFURIC ACID MANUFACTURING. A BIBLIOGRAPHY WITH ABSTRACTS.

May 71, 64p AP-94
Paper copy available from GPO $0.65 as EP9:94, SOD 5503-0007.

Descriptors: (*Air pollution, *Industrial wastes), (*Bibliographies, Air pollution), (*Sulfur oxides, Air pollution), (*Sulfuric acid, Air pollution), (*Smelting, Air pollution), (*Chemical industry, Air pollution), Sulfur dioxide, Air pollution control equipment, Public health, Abstracts, Standards, Economic analysis, Law (Jurisprudence), Atmospheric corrosion.
Identifiers: Air pollution control, Air pollution detection, Air pollution effects (Animals), Air pollution effects (Plants), Air pollution effects (Materials).

A compilation of approximately 200 abstracts which deal with sulfuric acid manufacturing as an emission source is presented. The abstracts cover the following categories: Emission sources, control methods, measurement methods, Air quality

measurements, Atmospheric interaction, Basic science and technology, Effects-human health, Effects-materials, Economic effects, Standards and c...eria, legal and administrative. (APCO abstract)

PB-200 680
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
AIR POLLUTION ASPECTS OF EMISSION SOURCES: CEMENT MANUFACTURING. A BIBLIOGRAPHY WITH ABSTRACTS.

May 71, 51p AP-95
Paper copy available from GPO $0.50 as EP4.9:95, SOD 5503-0008.

Descriptors: (*Air pollution, *Industrial wastes), (*Bibliographies, Air pollution), (*Cements, Air pollution), Abstracts, Air pollution control equipment, Particles, Dust control, Economic analysis, Public health, Atmospheric corrosion, Law (Jurisprudence).
Identifiers: *Cement industry, Air pollution control, Air pollution detection, Air pollution effects (Plants), Air pollution effects (Animals), Air pollution effects (Materials).

A compilation of approximately 130 abstracts which deal with cement manufacturing as an emission source is presented. The abstracts cover the following categories: Emission sources, control methods, measurement methods, air quality Measurements, Atmospheric interaction, Basic science and technology, Effects-Human health, Effects-plants and livestock, Effects-materials, Effects-economic, standards and criteria, Legal and administrative. (Author)

PB-200 661
Maine Port Authority, Portland.
TESTING AND EVALUATION OF OIL SPILL RECOVERY EQUIPMENT.

Dec 70, 164p EPA-WQO-15080-DOZ-12/70, W71-08942
Paper copy available from GPO $1.50 as EP 2.10:15080DOZ12/70.

Descriptors: (*Water pollution, Oils), (*Materials recovery, *Oils), (*Barriers, Water pollution), (*Skimmers, Water pollution), Mexico Gulf, Ocean currents, Booms (Equipment), Design, Performance evaluation.
Identifiers: *Oil pollution, *Water pollution control equipment.

The Gulf of Mexico, in March 1970, was the scene of a major equipment testing and evaluation study of oil spill control and recovery equipment. The tests took place during 30 knot winds, and 8 ft waves. The oil recovery equipment tested included mechanical barriers, air barriers, and skimming equipment. A detailed report containing both the test results on the capacilities and limitations of the various equipment types tested, and also recommendations on needed improvements was prepared. It was strongly recommended that adequate skimming capacity could be installed and maintained in close proximity to all major industries which would be considered potential oil spill hazards. Recommendations were also prepared concerning the methods of enlisting community aid, both in helping to support the installation of oil spill recovery equipment, and also in working to clean up such spills as do occur. (WRSIC abstract)

PB-200 102
Bureau of Radiological Health, Rockville, Md.
CONSTRUCTION AND EVALUATION OF A KIT-FORM MICRO-WAVE OVEN,
William Kane, Jr. 1971, 29p BRH-DEP-71-7
Paper copy available from GPO $0.35 as 1715-0016.

Descriptors: (*Cooking devices, Microwave equipment), (*Kits, *Microwave equipment), Assembling, Radiation hazards, Safety, Ovens.
Identifiers: *Microwave ovens, *Microwave radiation leakage, Electromagnetic radiation hazards, Heathkit microwave oven.

A Heathkit model GD-29 microwave oven was purchased and assembled in accordance with the manual supplied with the kit. As construction progressed, problem areas were observed and recorded. Most assembly problems were of a mechanical nature. After the oven was assembled, microwave leakage was observed to be less than 1 mW/sq cm. The possibility of hazards caused by errors in construction and wiring were investigated in the areas of door construction, interlock adjustments, and interlock wiring. The Heath microwave oven which was assembled will not comply with the performance standard for microwave ovens which will become effective October 6, 1971, primarily because objects can be inserted through the open screen in the door and the resulting leakage is in excess of 5 mW/sq cm. A list of recommended modifications is presented. (Author)

PB-200 143
Lockheed Missiles and Space Co., Sunnyvale, Calif. Ground Vehicle Systems.
FLYWHEEL FEASIBILITY STUDY AND DEMONSTRATION.
Final rept.,
R. R. Gilbert, J. R. Harvey, G. E. Hever, and L. J. Lawson. 30 Apr 71, 165p* LMSC-D0079115

Descriptors: (*Flywheels, Evaluation), (*Automobiles, *Hybrid propulsion), (*Air pollution, Automobiles), (*Exhaust emissions, Gasoline engines), Automobile engines, Air pollution control equipment, Automotive transmissions, Kinetic energy, Energy transfer, Design criteria, Feasibility.
Identifiers: *Air pollution control.

The report presents a study of the feasibility of application of Flywheel only and flywheel hybrid propulsion systems to four classes of vehicles. (Author)

PB-200 257
Utah Univ., Salt Lake City. Dept. of Mineral Engineering.
PYRITE DEPRESSION BY REDUCTION OF SOLUTION OXIDATION POTENTIAL.

Dec 70, 63p W71-09078, EPA-WQO-12010-DIM-08/70
Paper copy available from GPO $0.70 as EP210:12010-DIM08/70.

Descriptors: (*Pyrite, Depressing reagents), (*Frothing reagents, *Xanthates), (*Sulfide minerals, *Flotation), (*Depressing reagents, *Sodium sulfites), Flotation reagents, Cyanides, Toxicity, Hazardous materials, Lead sulfides, Copper inorganic compounds, Sulfides, Formates.
Identifiers: Formic acid/O-O- (diethyl-ester)-dithio-bis (thio-), Copper sulfides.

A study of pyrite depression by reducing agents with potassium ethylaxanthate as collector indicates that pyrite may be depressed effectively in the flotation of both lead and copper sulfide ores without the use of poisonous cyanide salts. More specifically, the use of sodium sulfite as the depressant may result in metallurgical, economical, environmental and safety advantages over the poison, cyanide. For example, in the case of the copper ore, the best results with cyanide as the depressant were a rougher concentrate recovery of 90.2% and a grade of 4.3% Cu. However, when sulfite was used as the depressant for the same recovery a grade of 7.3% Cu was obtained. (WRSIC abstract)

PB-200 400
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
EVALUATION OF THE WESTINGHOUSE CAPACITOR DISCHARGE MOBILE X-RAY MACHINE,
G. F. Grove, Jr. May 71, 32p BRH/DEP-71-8
Paper copy available from GPO $0.35/copy as stock no. 1715-0018, HE20.153:71-8.

Descriptors: (*X-ray apparatus, *Radiation hazards), (*Health physics, X-ray apparatus), Dosimetry, Exposure, Radiation dosage, Public health, Capacitors.

Tests were performed on a Westinghouse model MO-120C capacitor discharge mobile x-ray machine to determine accuracy of voltage indications, the relationship between voltage setting and current-time, line voltage effects and current drain, exposure reproducibility, focal spot size and location, correspondence between the collimator and light localizer, inherent filtration, half-value layer, radiation output, and tube housing and collimator leakage. Spurious radiation was found to originate in the tube under certain conditions. These conditions were investigated, and the observed radiation levels are reported. (BRH/DEP)

PB-200 514
Environmental Protection Agency, Research Triangle Park, N. C. Office of Air Programs.
MUNICIPAL INCINERATION: A REVIEW OF LITERATURE,
James R. Stear. Jun 71, 94p* AP-79
Paper copy available from GPO $1.00 as stock number 5503-0009.

Descriptors: (*Incinerators, *Reviews), (*Air pollution control equipment, Incinerators), (*Refuse disposal, Incinerators), (*Air pollution, *Combustion products), Bibliographies, Waste disposal, Design criteria, Urban areas, Combustion chambers, Scrubbers, Gas sampling, Cyclone separators, Gas filters, Electrostatic precipitators, Industrial engineering, Management engineering, Maintenance, Nitrogen oxides, Particles, Sulfur dioxide, Carbon monoxide, Cost estimates, Operating costs, Residues, Screenings.
Identifiers: Fabric filters, *Solid waste disposal.

A comprehensive review of municipal incineration as it is practiced in the U.S. and several foreign countries is presented. The quantity of refuse generated and its present and future composition, as it relates to the incineration disposal method is reviewed. A study of incinerators in operation and under construction yields descriptive information on continous-feed, batch-feed, ram-feed, metal conical, and waste-heat-recovery incinerators. The design of the incinerator and of its basic components is discussed. The air pollution control devices for removal of particulates and gases are discussed. The operation, management and maintenance of incinerators are discussed. The particulate and gaseous incinerator emissions, and the methods used for their measurement are described. The review ends with presentation of data on incineration research and pilot projects. (APCO abstract)

PB-200 517
Center for the Environment and Man, Inc., Hartford, Conn.
LONG-TERM EFFECTS OF AIR POLLUTION - A FIVE-YEAR RESEARCH PROGRAM,
G. D. Robinson. May 71, 37p* CEM-4029-438
APTD-0687
Contract CPA-22-69-155

Descriptors: (*Air pollution, *Project planning), Research, Forecasting, Research management, Government policies, Earth atmosphere, Precipitation (Meterology), pH, Flue gases, Stratosphere, Urban areas, Atmospheric motion, Tracer studies, Particles, Monitors.

A program of research on long term problems of air pollution is outlined. The major problem areas are first identified, with no attempt at a formal definition of 'long-term'. Priorities are allocated to the problem areas. Research projects are then identified and tabulated, where they are classified in two ways: according to the space-scale of the phenomena involved and according to the nature of the technique of the recommended attack. The space scales are divided into, local, regional, continental and global. Priorities allocated to the projects by application of the criteria are tabulated. An overall rate of expenditure is proposed and a time-table for work on some major projects is suggested. (APCO abstract)

PB-200 519
Environmental Protection Agency, Research Triangle Park, N. C. Air Pollution Control Office.
INTERSTATE SURVEILLANCE PROJECT: MEASUREMENT OF AIR POLLUTION USING STATIC MONITORS,
James H. Cavender, William M. Cox, Maurice Georgevich, Norman A. Huey, and George A. Jutze. May 71, 159p APTD-0666
Paper copy available from GPO $1.25 as stock number 5503-0006, EP.4.9/2:0666.

Descriptors: (*Air pollution, *Monitors), Surveillance, Statistical data, Gas sampling, Atmospheric corrosion, Sulfation, Nylon, Particles, Silver, Elastomers, Urban areas, Sulfur oxides, Sulfur dioxide, Nitrogen oxides, Acids, Hydrogen sulfide, Zinc, Fading, Discoloration.
Identifiers: *Interstate Surveillance Project, *Air pollution detection, *Air pollution effects (Materials), Soiling index.

The Interstate Surveillance Project was initiated with the following objectives: to obtain interstate, intrastate and international information on the types and degrees of air pollution in these areas and to provide information for later in-depth studies; to demonstrate the validity of the static monitor as a tool for measuring the effects of pollutants on materials; to provide continuing surveillance to determine air pollution trends in these areas. The basic structure, monitor components, and measuring capabilities of the monitoring unit are described. An informative discussion is given of the data tabulation of sampling results for all components of all stations. Evaluation of areas (which includes overall impact of pollution as well as the major pollution problems in the area) are presented. Project data evaluation is also given. (APCO abstract)

PB-200 623
French (R. T.) Co., Shelley, Idaho.
AEROBIC SECONDARY TREATMENT OF POTATO PROCESSING WASTES,
R. T. French. Dec 70, 181p W71-09526, EPA-WQO-12060EHV-12/70
Grant WPRD-15-01-68
Paper copy available from GPO $1.50 as EP.2.10:12060EHV12/70.

Descriptors: (*Water pollution, *Industrial wastes), (*Food processing, *Industrial waste treatment), (*Activated sludge process, Industrial wastes), Food industry, Potatoes, Biochemical oxygen demand, Coliform bacteria, Cost estimates, Clarifiers, Production engineering.
Identifiers: *Water pollution control, *Potato processing, Secondary sewage treatment.

The feasibility of using a complete mix activated sludge unit for secondary treatment of potato processing wastes was demonstrated. During the 1969-1970 processing season, both the activated sludge process and a flow through aeration process without secondary clarification were studied. The activated sludge unit was demonstrated to be capable of BOD removals, in excess of 90% over extended periods, with coliform removals in excess of 96%. With the flow through system, BOD removals ranged between 70 and 80%. Analysis of data obtained revealed that both the quantity of excess sludge produced and the amount of oxygen required were functions of the BOD removal rate and the mixed liquor volatile suspended solids concentration. The substrate removal rate coefficient was shown to be temperature dependent. The prevailing low air temperatures at the Shelley location did not cause system failure, but data obtained demonstrated the need to consider temperature loss in system design. Total annual treatment costs, excluding costs for waste activated sludge disposal, were estimated to be $.038 per lb BOD applied, and $0.21 per lb COD applied. Operation of thickener-clarifier on combinations of silt and biological solids was not successful. Failures with this unit demonstrated a need for the development of special silt removal and handling equipment for potato processing. (WRSIC abstract)

PB-200 648
GCA Corp., Bedford, Mass. GCA Technology Div.
HANDBOOK OF FABRIC FILTER TECHNOLOGY. VOLUME I. FABRIC FILTER SYSTEMS STUDY,
Charles E. Billings, and John Wilder. Dec 70, 649p* GCA-TR-70-17-G-Vol-1 APTD-0690
Contract CPA-22-69-38
See also Volume 2, PB-200 649.

Descriptors: (*Gas filters, *Reviews), (*Handbooks, Gas filters), (*Air pollution control equipment, Gas filters), (*Dust filters, Reviews), Fabrics, Mechanical efficiency, Maintenance, Filter materials, Aerosols, Fabrication, Dust control, Cost estimates, Operating costs, Particles, Electron microscopy, Pressure gradients, Yarns.
Identifiers: *Fabric filters, Air pollution control.

A report is presented on fabric filter technology in which the following areas are discussed extensively: Current developments in fiber fabric treatments and applications; The pressure drop, efficiency and performance characteristics observed in operating fabric filters and their relationship to the underlying physical and chemical phenomena of the collection process; The description of models of currently available fabric collectors; Fabric and filter properties of importance in application for industrial gas filtration; Engineering factors involved in the design of the overall system; Data on pressure drop performance and its variation; Practical guidelines for estimating the cost of various fabric filteration approaches; Operation and maintenance of fabric filters. (APCO abstract)

PB-200 649
GCA Corp., Bedford, Mass. GCA Technology Div.
APPENDICES TO HANDBOOK OF FABRIC FILTER TECHNOLOGY. VOLUME II. FABRIC FILTER SYSTEMS STUDY.

Dec 70, 228p* GCA-TR-70-17-G-Vol-2 APTD-0691
Contract CPA-22-69-38
See also Volume 1, PB-200 648, and Volume 3, PB-200 650.

Descriptors: (*Gas filters, *Reviews), (*Handbooks, Gas filters), (*Air pollution control equipment, Gas filters), (*Dust filters, Reviews), Fabrics, History, Manufacturers, Marketing, Design criteria, Mechanical efficiency, Adhesion, Equipment specifications, Humidity, Cost estimates, Capital costs, Filter materials, Maintenance, Particles, Aerosols.
Identifiers: *Fabric filters, Air pollution control.

Some of the areas covered by the appendices contained in the report include: Tabulation of the early history of the use of fabrics for dust and fume filtration; Principal U.S. manufacturers of cloth filter dust and fume collectors; Estimated 1968 and 1969 fabric filter sales; Estimate of the fabric filter market; Fabric filter applications in the non-metallic minerals industry; Force of adhesion between sphere and cylinder in liquid contact; Specific dust fabric filter resistance coefficients; Fabric filter manufacturers' summary, 1969; Glossary of fabric terminology; Some inorganic and metal fibers potentially suitable for high temperature filtration or control of electrostatic effects in fabrics; Chart of fiber properties, and electrical resistance vs. humidity; 1969 suppliers list, filter fabrics and related materials plus supplier brochures; Hopper configuration bibliography; Selected references on liquid filtration; Development of operating equations for the multicompartment collector; Field performance data for selected fabric filter installations; Costs of specific fabric filter applications, Troubleshooting checklists; Operational problem category analysis; Maintenance problems encountered in the development of new applications.

PB-200 650
GCA Corp., Bedford, Mass. GCA Technology Div.
BIBLIOGRAPHY. VOLUME III. FABRIC FILTER SYSTEMS STUDY.

Dec 70, 179p* GCA-TR-70-17-G-Vol-3 APTD-0693
Contract CPA-22-69-38
See also Volume 2, PB-200 649, and Volume 4, PB-200 651.

Descriptors: (*Gas filters, *Reviews), (*Bibliographies, Gas filters), (*Handbooks, Gas filters), (*Air pollution control equipment, Gas filters), (*Dust filters, Reviews), Fabrics, Mechanical efficiency, Theory, Manufacturers, Maintenance, Particles, Cost estimates, Aerosols, Filter materials.
Identifiers: *Fabric filters, Air pollution control.

A bibliography resulting from a literature search used in preparation of a Handbook of Fabric Filter Technology is presented. Five hundred reports were found and indexed and coded for retrieval. The reports are listed by author (s) and index description.

PB-200 651
GCA Corp., Bedford, Mass. GCA Technology Div.
FINAL REPORT. VOLUME IV. FABRIC FILTER SYSTEMS STUDY.

Dec 70, 130p* GCA-TR-70-17-G-Vol-4 APTD-0692
Contract CPA-22-69-38
See also Volume 3, PB-200 650.

Descriptors: (*Gas filters, *Reviews), (*Handbooks, Gas filters), (*Air pollution control equipment, Gas filters), (*Dust filters, Reviews), Fabrics, Recommendations, Mechanical efficiency, Design criteria, Surveys, Maintenance, Utilization, Engineering, Cost estimates, Particle size, Aerosols.
Identifiers: *Fabric filters, Air pollution control.

A final report is presented which describes a study directed to the definition of two alternative five-year research and development programs based on different levels of funding for fabric filter systems used in air pollution control applications. These plans provide specific performance, to improve economics of usage, and to promote extension of fabric filtration to control of a greater number of applications. Specific tasks undertaken include: A survey of engineering technology available as data or analytical design and operation equations; the identification and investigation of current practices, limitations, and problems of fabric filter systems in present usage and in possible future applications, and a review of the major types of fabric filter equipment available. (APCO abstract)

PB-200 695
Fiber Industries, Inc., Charlotte, N.C.
REUSE OF CHEMICAL FEBER PLANT WASTEWATER AND COOLING WATER

BLOWDOWN.

Oct 70, 70p W71-09524, EPA-WQO-12090EUX-10/70
Grant WPRD-100-01-68
Prepared in cooperation with Davis and Floyd Engineers, Inc., Greenwood, S. C. Paper copy available from GPO $0.70 as EP2.10:12090EUX10/70.

Descriptors: (*Water pollution, *Industrial wastes), (*Industrial waste treatment, *Water reclamation), (*Chemical industry, Industrial waste treatment), (*Chemical removal (Sewage treatment), *Chromium), (*Polyester fibers, Industrial engineering), Synthetic fibers, Chromates, Feedwater, Trickling filters, Plastics, Cost estimates, Biocides, Cooling water, Aeration, Lagoons (Ponds).
Identifiers: *Water pollution control equipment, Tertiary sewage treatment.

Waste waters from a Fortrel Polyester manufacturing plant consisted of organic chemical process wastes, cooling system blowdown, and sanitary wastes from the plant. A water reuse program was instituted which consisted of: (1) pretreatment of cooling waters for removal of heavy metals; (2) in-plant modifications and additions to the existing system to increase treatment plant capacity; and (3) a post treatment system for effluent polishing prior to selected reuse. The final system consisted of: (1) a chromate reduction unit rated at 120 gpm for concentrations of up to 300 mg/l CrO4 and designed for continuous operation; (2) equalization basins having a combined capacity of 195,000 gallons and containing sufficient mixing capacity to prevent short-circuiting and stratification; (3) a plastic media roughing filter consisting of two tiers of poly-vinyl chloride media 10 feet thick and 25 ft in diameter; (4) an aeration basin equipped with 175 hp of aeration and mixing capacity and using 100% recycle of clarifier sludge; (5) a peripheral flow type clarifier; (6) two series connecting polishing ponds; (7) a micro screen or algae screen; (8) a flocculant and/or carbon unit; (9) a sludge pond; and (10) a digester. Chromium was removed from the cooling tower blowdown for $.21 per pound of chromate removed. The plastic media trickling filter, used as a roughing filter, provided 40% BOD removal over a wide range of loading rates. The 0.33 mgd industrial and domestic waste water was treated and reused at a rate of 0.10 mgd for approximately 40 cents/1000 gallons. (WRSIC abstract)

PB-200 721
Process Research, Inc., Cambridge, Mass.
MATHEMATICAL MODEL OF THE ELECTRODIALYSIS PROCESS.
Water pollution control research series,
Kenneth T. Pruyn, Joseph J. Harrington, and J. Douglas Smith. Jul 69, 78p W71-09525
FWQA-17090-FTA-07/69
Contract FWQA-14-12-410
Paper copy available from GPO $0.70 as I67.13/4:ORD17090FTA07/69.

Descriptors: (*Desalting, Electrodialysis), (*Electrodialysis, *Computerized simulation), (*Demineralizing, Electrodialysis), (*Mathematical models, Electrodialysis), Computer programs, Cost estimates, Membranes, Design, Fouling, Industrial engineering, Piping systems, Operating costs, Capital costs.

A desalination electrodialysis unit was established as a control volume, and material balances around the control volume were formulated, involving input and output flows, types of charged particles to be exchanged, concentrations of charged particles, and percentage removal of individual ions as well as percentage removals of total ions. Significantly parameters involved included spacer design geometry, membrane properties (resistivity, current efficiency, separation factors, etc.) and mode of operation of the stack (current density, products stream concentration, waste/product ratio, waste stream pH, etc.). Performance equations were then formulated for resistivity, D.C. power input, current efficiency, number of stacks required, and the pumping headloss. Cost analyses were derived to include: electrodialysis stacks, stack piping, distribution piping, and pumps for stack related costs; rectifiers and process electrical for D.C. power costs; and acid storage tanks, acid feed pumps, instruments, and miscellaneous equipment for auxiliary costs. Equations derived for capital costs and operational costs were based on the January 1965 Engineering News-Record cost index. The program was run for plants of 1, 10, and 100 MGD, with capital and operating costs being $164,620 and 7.07cents/1000 gallons respectively for a 1 MGD plant. Program flow charts as well as actual computer outputs are presented. (WRSIC abstract)

PB-200 728
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
GUIDELINES: AIR QUALITY SURVEILLANCE NETWORKS.
May 71, 21p AP-98
Paper copy available from GPO $0.20 as EP4.9:98.

Descriptors: (*Air pollution, *Monitors), Instructions, Government policies, Design, Networks, Data processing, Data acquisition, Data retrieval, Management planning, Gas sampling, Instruments.
Identifiers: *Air Quality Surveillance Network, *Air Quality Control Regions, Air pollution detection.

The development of an air quality surveillance program is an inherent part of the control effort of the operation of Air Quality Control Regions. Guidelines are presented here which will assist State and local agencies in setting up air quality surveillance programs. The development of an air quality surveillance program includes determining the number and location of sampling sites, selecting appropriate instrumentation, and establishing a data information system. The report deals with four major aspects of regional surveillance: (1) objectives of surveillance, (2) design of a minimally adequate surveillance network, (3) laboratory requirements, and (4) data acquisition and analysis. (APCO abstract)

PB-200 827
American Public Works Association, Chicago, Ill. Research Foundation.
CONTROL OF INFILTRATION AND INFLOW INTO SEWER SYSTEMS.

Dec 70, 131p W71-09591, EPA-WQO11022-EFF-12/70
Contract DI-14-12-550
Paper copy available from GPO $1.25.

Descriptors: (*Sewers, Fluid infiltration), (*Water influx, Control), (*Waste water, Sanitary engineering), Urban areas, Surveys, Problem solving, Leakage, Joints (Junctions), Cracks, Manholes, Drains.

Problems were studied of infiltration of ground and surface waters into sanitary sewers and inflows from various connections to these sewers. Such water enters sewers through joints, cracks, breaks or indirectly through perforated or loose manhole covers or other faulty sewer structures. Inflow water is piped into the sewer from basement and foundation drains, roof leaders, and other legal or illegal connections of storm sewers and combined sewers. Two hundred and twelve public jurisdictions in the United States and Canada were contacted, and twenty-six communities were visited. Practices of consulting engineers and state and provincial water pollution control agencies were also surveyed. Twenty recommendations are given indicating the need for extensive investigation of the extent of the infiltration/inflow problem before relief sewers are constructed or wastewater treatment plants built or enlarged. (WRSIC abstract)

PB-200 828
Springfield Sanitary District, Ill.
RETENTION BASIN CONTROL OF COMBINED SEWER OVERFLOWS.
Aug 70, 104p W71-09592, FWQA-11023-08/70
Contract EPA-WQO-3-111-1
Paper copy available from GPO $1.00.

Descriptors: (*Combined sewers, Catch basins), (*Overflows, Control), (*Sanitary engineering, Illinois), Flood control, Storms, Rainfall intensity, Pumping stations, Streams, Water storage, Sewage disposal, Water pollution, Urban planning.
Identifiers: Springfield (Illinois), Retention basins.

The document reports on a 10 acre basin to collect and detain combined sewer overflows that bypass a pumping station during periods of high volume flow. Surface runoff accompanying rainstorms cause high volume flows which are diverted into the station channel. Such flows introduced highly toxic pollution loads into an Illinois creek and a fork of the Sangamon River. The retention basin was built to intercept these flows so that they could be stored temporarily and released at low flow rates to avoid shock pollution. In addition to the oxygen demand, production of algae may be objectionable at some installations for aesthetic reasons. Sludge accumulation must be taken into account in design of similar facilities. Suggestions for future designs of retention basins are included. (WRSIC abstract)

PB-200 846
Environmental Protection Agency, Research Triangle Park, N.C. Air Pollution Control Office.
AIR POLLUTION ASPECTS OF EMISSION SOURCES: NITRIC ACID MANUFACTURING--A BIBLIOGRAPHY WITH ABSTRACTS.

May 71, 37p AP-93
Paper copy available from GPO $0.45 as stock no. 5503-0004, EP4.9:93.

Descriptors: (*Air pollution, Nitric acid), (*Nitric acid, Emission), (*Bibliographies, Nitric acid), (*Industries, Nitric acid), Air pollution control, Public health, Measurement, Monitors, Standards, Abstracts.
Identifiers: Air pollution effects (Animals), Air pollution effects (Materials), Air pollution effects (Plants).

Contents:
Emission sources;
Control methods;
Measurement methods;
Atmospheric interaction;
Basic science and technology;
Effects - human health;
Effects - plants and livestock;
Effects - materials;
Effects - economic;
Standards and criteria;
Legal and administrative.

PB-200 873
California State Dept. of Agriculture, Sacramento. Bureau of Plant Pathology.
A SURVEY AND ASSESSMENT OF AIR POLLUTION DAMAGE TO CALIFORNIA VEGETATION IN 1970,
Arthur A. Millecan. Jun 71, 57p* APTD-0694
Contract CPA-70-91

Descriptors: (*Vegetation, *Air pollution), (*California, Air pollution), Damage, Injuries, Plants (Botany), Economic factors, Fruits, Flowers, Plant pathology, Vegetable crops, Smog.
Identifiers: *Air pollution effects (Plants).

A state wide survey was made in California to determine the areas of occurrence of plant injury due to air pollutants, and to assess the damage to agricultural plant crops. On the basis of observations and evaluations made by agricultural specialists California's 1970 crop losses due to air pol-

lutants were estimated to be approximately $25,690, 680. The losses were confined to 15 of the 58 counties in the state. The monetary loss figure does not include losses attributed to reduction in crop yield as a result of invisible damage with the exception of citrus and grapes. (APCO author)

PB-200 881
Kellogg (M. W.) Co., Piscataway, N.J. Research and Engineering Development.
REMOVAL OF SO2 FROM POWER PLANT FLUE GASES USING THE ALKALIZED ALUMINA PROCESS. PHASES I AND II. DATA EVALUATION PRELIMINARY PROCESS DESIGN, OPTIMIZATION, AND ECONOMICS.
Final rept.

28 Feb 70, 520p* APTD-0688
Contract PH-86-68-86
See also Rept. on Phase 3, PB-200 882.

Descriptors: (*Flue gases, *Desulfurization), (*Sulfur dioxide, Sorption), (*Sorbents, *Aluminum oxide), (*Air pollution, Sulfur dioxide), Regeneration (Engineering), Comminution, Beds (Process Engineering), Fluidized Bed processors, Dispersing, Economic evaluation, Electric power plants.
Identifiers: Alkalized alumina.

The results of a contractual effort to correlate and evaluate data from several sources, on the development of the alkalized alumina sorbent and process are reported in two phases: Phase I - data evaluation and preliminary process design, and Phase II - process optimization studies. This report includes an analysis of available attrition data, and a summary of the attrition test methods used. The process design study includes an evaluation of; sorption chemistry, current sorption data, and sorption modeling. Regeneration reactions and evaluation of the status of the data are presented with discussion of pilot plant results, bench scale tests with reducing gases, and evaluation of various sorbents. Process description; calculation, and vessel design are presented for three process designs; dispersed phase, fluid bed, and fixed bed. A stream reformer, a claus plant and a precipitator, are included for each process. A comprehensive economic analysis of the process is also included. (Author)

PB-200 882
Kellogg (M. W.) Co., Piscataway, N.J. Research and Engineering Development.
ECONOMIC EVALUATION OF METAL OXIDE PROCESSES FOR SO2 REMOVAL FROM POWER PLANT FLUE GASES. PHASE 3. COST SENSITIVITY STUDY OF MAJOR PROCESS PARAMETERS
Final rept.

31 Mar 70, 220p* APTD-0689
Contract PH-86-68-86
See also Rept. on Phase 1 and 2, PB-200 881

Descriptors: (*Flue gases, Desulfurization), (*Desulfurization, Economic evaluation), (*Sulfur dioxide, Sorption), (*Air pollution, Sulfur dioxide), Regeneration (Engineering), Electric power plants, Costs, Sorbents, Oxides, Beds (Process engineering).

A cost sensitivity study has been made in which the effects of major process parameters on plant investment and operating costs have been determined. A tabulation of the parameters studies is included. Results are reported as changes from the base case values which were obtained from the previously completed phases 1 and 2 evaluations. Three battery limits base case process designs were developed in phases 1 and 2 (dispersed phase, fluid bed, fixed bed), but not all of the variables were evaluated in phase 3 for three designs. A copy of the flow sheet, process description, battery limit investment and operating cost for each of the base case designs is included for reference. A brief summary of the results on economics of the major process variables studied is shown. As a reference case, the base case investment and operating costs are also shown. (Author)

PB-200 996
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME VII. MEASUREMENTS OF DISPERSAL AND CONCENTRATION, IDENTIFICATION, AND SANITARY EVALUATION OF VARIOUS AIR POLLUTANTS, WITH SPECIAL REFERENCE TO THE ENVIRONS OF ELECTRIC POWER PLANTS AND FERROUS METALLURGICAL PLANTS.
M. Y. Nuttonson. 1971, 112p* APTD-0686
Contract PHS-AP-00786
See also Volume 6, PB-198 527.

Descriptors: (*Air pollution, *Atmospheric motion), (*USSR, Air pollution), (*Urban areas, Air pollution), (*Metal industry, Air pollution), (*Electric power plants, Air pollution), Public health, Iron ad steel industry, Foundries, Thermal power plants, Spectrochemical analysis, Meteorological data, Aerosols, Flue gases, Industrial wastes, Combustion products, Particles, Sulfur dioxide, Paper industry, Atmospheric diffusion, Translations.
Identifiers: *Air pollution detection, *Air pollution effects (Animals).

Contents:
- Distribution of aerosols in the free atmosphere around Krasnoyarsk;
- Spectral method of determination of a series of elements in atmospheric aerosols;
- Sanitary evaluation of air pollution in areas around ferrous metallurgical plants;
- Experiment in the use of a helicopter for a hygienic study of the dynamics of air pollution;
- New method of calculating the dispersal of discharges from thermal electric power plants in atmospheric air and its sanitary evaluation;
- Sanitary evaluation of atmospheric air pollution in the area of a high capacity thermal electric power plant;
- Discharge of flue gases and ash by electric power plants and calculation of their concentrations in the atmosphere.

PB-201 133
Bonner and Moore Associates, Inc., Houston, Tex.
AN ECONOMIC ANALYSIS OF PROPOSED SCHEDULES FOR REMOVAL OF LEAD ADDITIVES FROM GASOLINE.

25 Jun 71, 233p* RGH-015 APTD-0703
Contract EPA-CPA-68-02-0050
Errata sheet inserted.

Descriptors: (*Gasoline, *Economic analysis), (*Lead organic compounds, Removal), (*Air pollution, Lead organic compounds), Exhaust emissions, Petroleum industry, Marketing, Feasibility, Scheduling.
Identifiers: Air pollution control.

An investigation of the economic impact of various gasoline removal schedules is reported. These schedules varied in rapidity of lead removal and in the number of gasoline grades produced. Eleven proposal schedules were grouped into two classes, one related to a two-pump market system, the other to a three-pump system. In all cases one grade of gasoline was required to be lead free by 1974 to satisfy the needs of any 1975 model cars equipped with exhaust reactors requiring unleaded fuel. The basic research octane level of this gasoline was set at 93 RON. A feasibility analysis, which was required for all eleven schedules, examined approximate capital costs, pool octane numbers, aromatics concentrations, prime blending component requirements, and year-to-year rates of increase in gasoline volume times octane. A preliminary selection was made of the slowest and fastest lead removal schedules for 3-grade cases and for 2-grade cases. Spot year detailed analysis of all schedules was also determined. The report includes a detailed summary of conclusions, and a detailed description of the methodology used. (Author)

PB-201 205
Kentucky Dept. of Health, Frankfort.
CODIFICATION OF SOLID WASTE MANAGEMENT AUTHORITY IN KENTUCKY: APPENDIX-A.

1971, 183p EPA-SW-6TSG-71

Descriptors: (*Waste disposal, *Kentucky), (*Wastes, Solids), (*Legislation, Waste disposal), Statutes, Regulations, Organizations, Public management, Coding, Sanitary engineering.
Identifiers: *Solid waste management.

A codified outline of the Kentucky laws and regulations relating to solid waste management includes all relevant statutes enacted before the 1970 legislative session, and regulations in force as of February 1970. The enforcement authority to perform operations or to regulate operations related to solid waste management is presented in three sections. This report is an appendix to the Kentucky Solid Waste Management Plan; Status Report, 1970. (EPA abstract)

PB-201 216
IIT Research Inst., Chicago, Ill.
COOLING TOWER STUDY.
Final rept. 23 Jun 69-22 Jun 70,
John Stockham. Jan 71, 124p* IITRI-C6187-3
APTD-0702
Contract CPA-22-69-122

Descriptors: (*Cooling towers, Environmental surveys), (*Airborne wastes, Cooling towers), Climatology, Plumes, Effluents, Water vapor, Diffusion, Statistical data, Pennsylvania, Air pollution.
Identifiers: Natural draft cooling towers, Thermal pollution.

The purpose of this study was to describe and evaluate the potential effects that the emissions of water vapor and heat from natural draft cooling towers have on the local environment, climate, and nearby electrical power station emissions. Field tests were conducted at the Keystone generating station near Shelocta, Pennsylvania. Observations and measurements were made intermittently during September, November, and December 1969. (Author)

PB-201 408
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
USERS MANUAL: SAROAD (STORAGE AND RETRIEVAL OF AEROMETRIC DATA).

Jul 71, 64p APTD-0663

Descriptors: (*Data storage, Air pollution), (*Air pollution, Information retrieval), Data processing, Data storage devices, Magnetic tapes, Meteorological data.
Identifiers: National Aerometric Data Bank, SAROAD (Storage and Retrieval of Aerometric Data), Storage and retrieval of aerometric data.

SAROAD (Storage and Retrieval of Aerometric Data) is the data-handling system adopted by the Environmental Protection Agency to promote standard methods of handling air quality and related meteorological data. This manual explains in detail how agencies should report air quality and related meteorological data in SAROAD formats for inclusion in the National Aerometric Data Bank. (Author)

PB-201 409
Oregon State Univ., Corvallis. Water Resources Research Inst.
STUDY OF THE SOCIAL AND ECONOMIC EFFECTS OF CHANGES IN AIR QUALITY.
Annual rept. Jul 70-Jun 71,
R. Charles Vars and Gary W. Sorenson. Jun 71, 70p APTD-0696
Contract CPA-70-117

Descriptors: (*Air pollution, *Economic surveys), (*Sociology, Air pollution), Refuse disposal, Costs, Industries, Social psychology, Populations, Attitudes, Control, Oregon.
Identifiers: Air pollution control, Open burning, Willamette Valley.

A 2-phase research effort is summarized. The first phase is concerned with measurement of the economic changes consequent to the introduction of various air pollution control policies. Areas of specific concern in this phase are as follows: the pollution production function; measurement of the costs of regulating open field burning in the Willamette Valley; the impact of air quality variations on tourist related industries. The second phase deals with social effects. A theoretical model concerning the effects of air quality changes on peoples attitudes and mass media use patterns has been formulated as a means of measurement of change. Each of the following objectives which relate to this model, are discussed: completion of interviews and evaluation of response rates; completion of coding, key punching and varification; completion of visibility measures; analysis of air quality perceptions of respondents; analysis planned for the forthcoming year. (APCO abstract)

PB-201 410
Institute of Gas Technology, Chicago, Ill.
EMISSION REDUCTION USING GASEOUS FUELS FOR VEHICULAR PROPULSION.
Final rept.

Jun 71, 267p* APTD-0698
Contract EPA-APCO-70-69

Descriptors: (*Automotive fuels, Air pollution), (*Air pollution, *Exhaust gases), (*Liquefied petroleum gases, Automotive fuels), (*Natural gas, Automotive fuels), Propane, Ammonia, Hydrogen, Fuel consumption, Logistics, Cost estimates, Availability, Buses (Vehicles), Diesel engines, Spark ignition engines, Urban areas.
Identifiers: *Automobile exhaust, Air pollution control.

The findings of a study are presented as they relate to each of the following objectives: To provide a comprehensive vehicular pollution emissions by using gaseous fuels in commercially available engine systems; To examine the logistics of gaseous fuels to assess the availability, cost, storage and handling methods and safety requirements of gaseous fuels; To determine the feasibility of using natural gas as a supplementary fuel in a two stroke cycle, diesel powered intercity bus as a means of reducing exhaust pollution while operating in urban areas and bus terminals; To recommend specific research and development programs necessary to confirm or establish the low emission characteristics and economic feasibility of selected gaseous fueled vehicular engine systems. (Author)

PB-201 422
General Technologies Corp., Reston, Va.
INFRARED SPECTROSCOPIC STUDY OF GAS--SOLID INTERACTIONS.
Rept. no. 3 (Final),
Edwin F. Rissmann. May 71, 85p APTD-0704
Contract EPA-CPA-70-63
See also rept no. 2 dated Apr 70, PB-194 136.

Descriptors: (*Air pollution, *Sulfur dioxide), (*Adsorption, Sulfur dioxide), (*Adsorbents, *Limestone), (*Infrared Spectroscopy, Adsorption), Infrared spectrometers, Calcines, Chemical analysis, Electron probes, X ray spectroscopy, Impurities, EDTA, Potassium halides, Calibration, Roasting, Scrubbers.
Identifiers: *Gas surface interactions, *Air pollution control, Auger electron spectroscopy.

Investigations have been conducted in an effort to develop rapid reliable methods for analysis of reacted limestone and limestone slurries. In this area new thin film infrared cells have been developed and demonstrated. The cells developed were then used to obtain calibration curves for species of interest in several solvent systems which would be of use in analyzing either reacted solid limestones or limestone slurries. In another phase of this program, a study was made of the influences of impurities on the dead-burning of limestone. Specifically, a study using infrared spectroscopy, electroprobe investigations and auger spectroscopy revealed both the occurrence of chemical reactions between lime and limestone and impurities at higher calcination temperatures and diffusion of impurities to surfaces and into pores. (Author)

PB-201 456
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
GUIDE FOR AIR POLLUTION EPISODE AVOIDANCE.

Jun 71, 151p AP-76
Contract PH-22-68-32
Paper copy available from GPO $0.70, as SN 5503-0014.

Descriptors: (*Air pollution, Control), Forecasting, Monitors, Meteorological data, Emission, Sources, Contaminants, Socioeconomic status, Populations, Manuals, Costs, Public health, Data transmission.
Identifiers: *Air pollution episodes, Emergency action plans, *Air pollution control.

A guide is presented for the purpose of assisting authorities in the formulation and implementation of emergency action plans for the avoidance of air pollution episodes. The material presented in this guide covers the planning, technical, social, economic, legal, and administrative factors of importance in episode avoidance and control activities and in the establishment of an action center. The first chapter introduces the reader to the nature of episodes and the second presents an overview of episode avoidance plans and their implementation. Subsequent chapters present detailed information on specific topics related to the design and function of episode avoidance plans. (OAP abstract)

PB-201 457
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
GUIDE FOR CONTROL OF AIR POLLUTION EPISODES IN MEDIUM-SIZED URBAN AREAS.

Jun 71, 66p AP-77
Contract PH-22-68-32
Paper copy available from GPO $0.40, as SN 5503-0013.

Descriptors: (*Air pollution, *Urban areas), Control, Forecasting, Data transmission, Socioeconomic status, Populations, Public health, Meteorological data, Contaminants, Manuals, Costs, Emission, Sources.
Identifiers: *Air pollution episodes, Emergency action plans.

A manual to assist local air pollution officials concerned with the design and implementation of Emergency Action Plans for the avoidance of air pollution episodes, is presented. Section 1 of the manual deals with information that should help the local authority to understand and define the factors that constitute an air pollution episode. This involves; forecasting air pollution potential, air quality decision criteria, data collection communications, and socioeconomic factors. Section 3 discusses the formulation and operation of a typical Emergency Action Plan. Section 4 presents the Emergency Action System and describes its role in implementing an Emergency Action Plan. A glossary of air pollution terms is included in the appendices. (OAP abstract)

PB-201 458
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
GUIDE FOR CONTROL OF AIR POLLUTION EPISODES IN SMALL URBAN AREAS.

Jun 71, 67p AP-78
Contract PH-22-68-32
Paper copy available from GPO $0.40, as SN 5503-0012.

Descriptors: (*Air pollution, *Urban areas), Control, Contaminants, Atmosphere, Sulfur oxides, Carbon monoxide, Oxidizers, Nitrogen oxides, Meteorological data, Emission, Sources, Socioeconomic status, Populations, Monitors, Manuals.
Identifiers: *Air pollution episodes, Emergency action plans.

A manual to assist local air pollution officials with the design and implementation of Emergency Action Plans for [illegible]voidance of air pollution episodes is presented. The manual is directed toward the needs of relatively small cities. Section 2 presents the following information as an aid in understanding and defining the factors that constitute an air pollution episode: the nature and effects of atmospheric pollutants; and meteorological factors related to air pollution episodes. Section 3 discusses the formulation and operation of a typical Emergency Action Plan. Section 4 presents a list of items to be considered when formulating an Emergency Action Plan. (OAP abstract)

PB-201 459
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME VIII. A COMPILATION OF TECHNICAL REPORTS ON THE BIOLOGICAL EFFECTS AND THE PUBLIC HEALTH ASPECTS OF ATMOSPHERIC POLLUTANTS,
M. Y. Nuttonson. Jul 71, 170p* APTD-0700
Contract PHS-AP-00786
See also Volume 7, PB-200 996.

Descriptors: (*Air pollution, *Public health), (*Chemical industry, Air pollution), (*USSR, Air pollution), (*Toxicology, Air pollution), (*Petrochemistry, Air pollution), Permissible dosage, Adipic acid, Sebacic acid, Contaminants, Atmosphere, Hydrocarbons, Carbon dioxide, Nitrogen heterocyclic compounds, Maleic anhydride, Acetophenones, Manganese, Sulfur oxides, Sulfuric acid, Nitric acid, Hydrochloric acid.
Identifiers: *Air pollution effects (Animals), Hexane diamines, Maximum allowable concentration.

A volume consisting of a collection of reports dealing with a number of investigations conducted in the Soviet Union at its various public health institutes and in university departments of public health is presented. The results of the investigations provide a basis for the establishment of a new series of maximum permissible concentrations for new toxic substances in the atmospheric air, and constitute the scientific criteria for assessing the degree of pollution. The material included in this volume deals with the response of the organism: (1) to low concentrations of chemical air pollutants around major petrochemical complexes that are now under intensive development; (2) to low concentrations of air pollutants around chemical plants manufacturing as raw material for nylon production, the salts of adipic

acid and hexamethylenediamine and also salts of sebacic acid and hexamethylenediamine; and (3) to the various concentrations of air pollutants around organic synthesis plants and other facilities of the new chemical industry. Methods of determination of low concentrations of various substances in the atmosphere air are also described in some of these papers. (APCO abstract)

PB-201 465
Bureau of Mines, Pittsburgh, Pa. Div. of Fossil Fuels.
SYSTEMS STUDY OF DATA AVAILABILITY ON NATURAL GAS.

Jun 71, 111p* APTD-0701
Contract EPA-APO-A-501

Descriptors: (*Natural gas, Information systems), (*Information centers, Planning), Data storage, Information retrieval, Cost engineering, Marketing, Production rate, Resources, Prices, Demand (Economics), Computer programming.
Identifiers: Data banks.

The report discusses the availability of natural gas data, sources of data, data deficiencies, and the cost of instituting a data bank. It has been proposed that a natural gas data bank be established using data sources which are credible, ongoing, providing a continuous data series, yielding specialized information, and sufficiently uniform for programming. The data bank will show the dynamic phases of natural gas supplies from potential resources to proved reserves and annual production. The computerized data will indicate the manner in which domestic and foreign supplies are linked to the U.S. markets and utilized by residential, commercial, electric utilities, industrial, and other consumer sectors within specific areas. Information pertinent to natural gas supply development rates, natural gas prices, current and future consumer demands, and sulfur quality evaluations will be entered in the data bank. (APCO abstract)

PB-201 472
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
AIR POLLUTION ASPECTS OF EMISSION SOURCES: ELECTRIC POWER PRODUCTION--A BIBLIOGRAPHY WITH ABSTRACTS.

May 71, 319p AP-96
Paper copy available from GPO $2.25 as EP4.9:96 or SN 5503-0011.

Descriptors: (*Air pollution, *Electric power generation), (*Bibliographies, Air pollution), Combustion products, Public health, Livestock, Standards, Criteria, Law (Jurisprudence), Economic factors, Management, Abstracts.
Identifiers: Air pollution control, Air pollution detection, Air pollution effects (Animals), Air pollution effects (Plants), Air pollution effects (Materials).

A compilation of approximately 1,040 abstracts concerning the contribution of electric power production to the air pollution level in the U.S. The abstracts are arranged in the following categories: Emission sources, control methods, measurement methods, Air quality measurements, Atmospheric interaction, Basic science and technology, Effects human-health, Effects-plants and livestock, Effects-materials, Economic effects, Standards and criteria, Legal and administrative, and Social aspects. (Author)

PB-201 647
Aerospace Corp., El Segundo, Calif.
HYBRID HEAT ENGINE/ELECTRIC SYSTEMS STUDY. VOLUME I: SECTIONS 1 THROUGH 13.
Final rept. Jun 70-Jun 71,
Joseph Meltzer, and Donald Lapedes. 1 Jun 71, 551p TOR-0059 (6769-01)-2-Vol-1
Contract FO4701-70-C-0059
See also Volume 2, PB-201 646.

Descriptors: (*Electric automobiles, Feasibility), Electric propulsion, Design criteria, Equipment specifications, Electric batteries, Stirling cycle engines, Gas turbine engines, Rankine cycle, Spark ignition engines, Diesel engines, Exhaust emissions, Air pollution.
Identifiers: Hybrid propulsion systems.

The report contains the results of a study to determine the feasibility of using a hybrid heat engine/electric propulsion system to reduce air pollution from exhaust of street operated vehicles. In this concept, the source of power is a combination of a heat engine and batteries. Several types of heat engines and batteries and other major components were examined for several classes of vehicles. Results include estimated exhaust emissions, major component requirements and estimated vehicle costs. (Author)

PB-201 646
Aerospace Corp., El Segundo, Calif.
HYBRID HEAT ENGINE/ELECTRIC SYSTEMS STUDY VOLUME II: APPENDICES A THROUGH F.
Final rept. Jun 70-Jun 71,
Joseph Meltzer, and Donald Lapedes. 1 Jun 71, 313p TOR-0059 (6769-01)-2-Vol-2
Contract FO4701-70-C-0059
See also Volume 1, PB-201 645.

Descriptors: (*Electric automobiles, Feasibility), Electric propulsion, Performance evaluation, Computerized simulation, Computer systems programs, Exhaust emissions, Experimental design.
Identifiers: Hybrid propulsion systems.

The report contains supplementary data forming the appendices for Volume 1 of the Final Report with the same title. (Author)

PB-201 648
Alaska Univ., College. Inst. of Marine Science.
BIOLOGICAL EFFECTS OF COPPER AND ARSENIC POLLUTION.
Final rept.,
D. K. Button, and S. S. Dunker. Apr 71, 61p* R71-8 W71-10637, EPA-WQO-18050-DLW-04/71

Descriptors: (*Water pollution, *Marine microorganisms), (*Copper, Water pollution), (*Arsenic, Water pollution), (*Toxicology, Water pollution), Phosphates, Metabolism, Manganese, Antimetabolites, Nutrients, Trace elements, Microbiology, Marine biology, Yeasts.
Identifiers: *Water pollution effects (Animals).

Inhibitory effects of copper toward marine microorganisms were studied. Phosphate was found to prevent copper inhibition. Growth and phosphate flux kinetics were described. These phosphate limited systems were found to be copper sensitive only under conditions of manganese deficiency. Toxicity occurred in this normally rather resistant yeast and in hydrocarbon oxidizing microorganisms at about .000001 M. Arsenate was among a number of metabolic inhibitors found to inhibit phosphate transport; phosphate also competitively reduced arsenate uptake. Both arsenate and phosphate are accumulated by the same active transport system in which velocities increase as the hydrogen ion is increased, saturation of the system does not occur, and the transport temperature coefficient is very large. Both arsenate and copper are important at existing concentrations in the environment. When nutrients are dilute these antimetabolites prevent microbial metabolism thus affecting the steady state chemistry which they control. Toxicity levels of antimetabolites depend not only on populations and chelate concentrations but in a major way on free nutrients and trace metal levels. (Author)

PB-201 649
Rutgers - The State Univ., New Brunswick, N.J. Water Resources Research Inst.
OXYGEN REGENERATION OF POLLUTED RIVERS: THE DELAWARE RIVER,
William Whipple, Jr., Joseph V. Hunter, Frank W. Dittman, Shaw L. Yu, and George W. Mattingly.
Dec 70, 93p W71-10638, EPA-WQO-16080-DUP-12/70
Paper copy available from GPO $1.00 as EPA 16080 DUP 12/70.

Descriptors: (*Water pollution, *Oxygenation), (*Waste treatment, Oxygenation), (*Stream pollution, Waste treatment), (*Aerators, Stream pollution), Aeration, Oxygen, Rivers, Cost estimates, Diffusers, Biochemical oxygen demand, Abatement.
Identifiers: *Water pollution control methods, *Water pollution control equipment.

Tests of surface instream aerators and of bottom diffuser aerators were conducted on the Delaware River near Philadelphia in order to determine the practicability of induced oxygenation of deep navigable rivers. The diffuser was tested at various depths up to 38 feet, but its performance in pounds of oxygen per horsepower hour decreased markedly in the deeper water. Performance of the surface aerator appeared to be somewhat improved over results previously found in a shallower river. Cost estimates and systems analysis led to the conclusion that induced oxygenation by aerators appears to constitute an economical alternative to advanced waste treatment on the Delaware River. This would require structurally reinforced surface aerators in some areas, and bottom diffuser aerators where the surface aerators would interfere with navigation. However, oxygen diffusers developed by others may provide an even more economical means of induced oxygenation for such rivers. (Author)

PB-201 650
Michigan State Univ., East Lansing. Dept of Physiology.
TOXIC ACTION OF WATER SOLUBLE POLLUTANTS ON FRESHWATER FISH,
Paul O. Fromm. Dec 70, 59p W71-10639, EPA-WQO-18050-DST-12/70
Paper copy available from GPO $0.65 as EPA 18050 DST 12/70.

Descriptors: (*Water pollution, Insecticides), (*Fishes, Water pollution), (*Insecticides, *Aquatic biology), Chromium, Diffusion, Ammonia, Toxicology, Stress (Physiology), Trout, Sodium, Dieldrin, Malathion, Sulfonates, Blood plasma.
Identifiers: *Water pollution effects (Animals).

Over a five year period experiments on rainbow trout indicated that exposure to chromium and to forced exercise caused a transient increase in plasma cortisol. Exposure to ammonia (a) caused a decrease in the rate of total nitrogen excretion and in ammonia excretion (b) caused some histopathological changes in trout gills but oxygen transport by hemoglobin was unaffected (c) caused a very slight increase in urea excretion by trout but a very significant rise in goldfish. Hyperexcitability observed in ammonia-exposed trout was not noticeable in the more resistant goldfish. Ammonia may kill fish by prevention of excretion of normal amounts of endogenous ammonia. Experiments with isolated-perfused gills of trout have shown among other things that (a) gill blood flow patterns are significantly affected by epinephrine (b) when perfused with Ringer solution there was a small but significant loss of sodium into the bath solution (c) perfusion fluid sodium and epinephrine appear to control sodium uptake by the gill (d) transfer of dieldrin into the vascular system occurred only when plasma protein, or more probably plasma lipoprotein was present in the perfusion fluid (e) short term exposure to dieldrin, rotenone, malathion and MS-222 reduced perfusion flow rate through isolated gills

but exposure to 1 mg/L methoxychlor was without effect. Decrease in flow rate correlated well with lamellar perfusion. (Author)

PB-201 651
Southern Research Inst., Birmingham, Ala.
AN ELECTROMEMBRANE PROCESS FOR REGENERATING ACID FROM SPENT PICKLE LIQUOR.
Robert E. Lacey. Mar 71, 85p W71-10640, EPA-WQO-12010-EQF-03/71
Paper copy available from GPO $1.00 as EPA 12010 EQF 03/71.

Descriptors: (*Pickling compositions, *Materials recovery), (*Ion exchanging, Pickling compositions), (*Industrial waste treatment, Pickling compositions), Sulfuric acid, Cation exchanging, Anion exchanging, Iron and steel industry, Membranes, Regeneration (Engineering), Cost estimates, Water pollution.
Identifiers: Water pollution control.

Studies of an electromembrane process for regenerating acid from spent sulfuric acid pickle liquor have indicated that the process is technically feasible. The studies have shown that the iron ions in spent pickle liquor can be removed and replaced by hydrogen ions to regenerate H2SO4 in electromembrane cells. A method of removing iron from spent liquor that involves the formation of insoluble iron hydroxides is preferrable to plating iron metal onto cathodes. Estimated treatment costs were $0.045 plus or minus 0.002 per gallon, whereas the combined costs of purchasing acid and disposing of spent liquor by existing methods were in the range of $0.015 to $0.06 per gallon of spent liquor. A determination of the long-term performance of the ion-exchange membranes when treating actual pickle liquors that contain organic pickling aids is needed. (Author)

PB-201 656
American process Equipment Corp., Panama City, Fla.
VORTEX SEPARATION FOR OIL SPILL RECOVERY SYSTEMS.

Oct 70, 62p* W71-10653, EPA-WQO-15080-EUU-10/70
Paper copy available from GPO $0.60 as EPA 15080 EUU 10/70.

Descriptors: (*Water pollution, Oil recovery), (*Oil recovery, Separators), Vortex generators, Skimmers, Vacuum apparatus, Overflows, Prototypes, Tests.
Identifiers: *Oil spills, *Vortex separation process, *Oil water separators.

In recent years the subject of oil spills has become of increased public interest. The demand for quick, effective solutions to the problem has brought about extensive programs for the development of equipment and technology for the safe, fast and efficient recovery of spilled oils from water. Research was begun to develop a full scale prototype oil/water separator, potentially capable of filling the need for a continuous, rapid, efficient oil/water separator, operable in choppy to moderately heavy seas, and capable of separating low concentration oil/water mixtures into recovered oil nearly free of water and clear water suitable for return to sea. A simple vortex separation process is described.

PB-201 698
Weston (Roy F.)., Inc., West Chester, Pa.
FEASIBILITY OF JOINT TREATMENT IN A LAKE WATERSHED.

Nov 69, 116p W71-10650, FWPCA-11060-FAE-11/69
Grant WPRD-66-01-68
Report on the Feasibility of Joint Municipal and Industrial Wastewater Treatment in the Onondaga Lake Watershed, Onondaga Coubty, New York.

Descriptors: (*Industrial wastes, Waste treatment), (*Sewage, Waste treatment), (*Waste treatment, *New York), Lakes, Watersheds, Stabilization, Cost estimates, Sludge, Waste water, Sampling, Toxicity, Feasibility.
Identifiers: Onondaga Lake Watershed, Onondaga County.

A feasibility study to determine the practicality of joint treatment of municipal and industrial wastewater was initiated in Onondaga County, New York. The 24 industries included in both the Ley Creek and the Metropolitan Sanitary districts were contacted as to their production of wastewaters and their effluents samples as needed. Bench scale studies were then used to determine the feasibility of the various activated sludge systems. A sampling and analysis program was conducted to determine the characteristics of the wastewater influents to both plants, with the results indicating that although toxicity was a potential problem it was causing no problems at present. Therefore, the primary pollutant to be removed as organic material. Total organic loads at both the Ley Creek and the Municipal Plant were equal, but flow to the Municipal Sewage Treatment Plant was nearly three times as great as the flow to Ley Creek. The Municipal Sewage Treatment Plant was chosen as the outfall because of greater dilution capacity of Onondaga Lake. Activated sludge treatment of the primary effluent of both plants was shown to be feasible, with the Ley Creek Sewage treatment plant destined for eventual phasing-out. Cost estimates for different system configurations (conventional activated sludge, contact stablization, etc.) ranged from $23,000-$30,000 for capital cost and $3,700-$4,400/year for operation and maintenance. (WRSIC abstract).

PB-201 699
Gulf South Research Inst., New Orleans, La.
POLYMERIC MATERIALS FOR TREATMENT AND RECOVERY OF PETROCHEMICAL WASTES.
Water pollution control series,
Elias Klein, Shyamkant V. Desai, James K. Smith, and Robert E. C. Weaver. Mar 71, 78p W71-10651, EPA-WQO-12020-DQC-03/71
Paper copy available from GPO $0.70/copy as E.P.2.10:12020DQC03/71

Descriptors: (*Industrial waste treatment, *Osmosis), (*Chemical industry, Industrial waste treatment), (*Water pollution, *Petrochemicals), (*Glycerol, Industrial waste treatment), Membranes, Pilot plants, Cellulose acetate, Permeability, Capillary tubes, Cost estimates.
Identifiers: *Reverse osmosis, *Water pollution control.

Three operational modes for removing glycerin from waste streams by reverse osmosis were examined. The three modes were: (1) a single-stage reverse osmosis unit which was demonstrated to be capable of removing 27% of the available glycerin, 92% of the inorganics, and 94% of the polyglycerines available in the feed; (2) a three-battey multi-stage unit with forward feed of the raffinate to subsequent reverse osmosis recovery batteries which provided a product stream containing 31% of the available glycerin, no inorganics, and 3.9% of the available polyglycerines; and (3) an alternate two battery multi-stage counter-current recovery unit which provided a waste stream containing 31% of the available glycerin, no inorganics, and 5.2% of the available polyglycerines. Membranes used were asymmetric cellulose acetate butyrate and cellulose acetate. Experimental pilot scale studies performed with tubular membrane models readily accommodated the sample plant stream being used. Optimum selectivity and good separation was achieved under operating pressures ranging from 600 to 800 psig. Product throughput rate appeared to be the limiting factor, being highly sensitive to both increased turbulence and reduced feed viscosities. A cost analysis of a typical multi-stage forward feed operation operated at 600 psig was estimated. Payout for the operation was 3.8 years at a 26% rate of return, making it an extremely favorable investment. (WRSIC abstract)

PB-201 700
Uniroyal, Inc., Wayne, N. J. Research Center.
FLEXIBLE HOLDING TANK FOR PLEASURECRAFT SANITARY SYSTEM.
Water pollution control research series,
Mark W. Olson. Aug 70, 54p W71-10652, EPA-WQO-15020-DGR-8/70
Contract FWQA-14-12-506
Paper copy available from GPO $0.55/copy as E.P.2.10:15020DGR8/70.

Descriptors: (*Storage tanks, Design criteria), (*Boats, *Sewage disposal), Environmental engineering, Water pollution, Structural members, Synthetic elastomers, Expandable structures.
Identifiers: *Waste storage, *Pleasure craft.

The problem of increasing numbers of small pleasurecraft and resulting increases in the pollution problems resulting from the sanitary wastes from these crafts has caused much concern. Formerly the waste from these crafts was dumped into the surrounding water, causing major pollution difficulties. Of the several possible means of handling sanitary waste from small pleasurecrafts, the most direct would be storing of the waste until it could be disposed of on shore, perhaps after treatment. One of the main problems in development of such a disposal system in small crafts is the probable lack of space for installation of a holding tank. A means of overcoming this obstacle has been sought through the use of a flexible holding tank which could allow for installation in hidden and almost inaccessible places with a minimum of structural changes. The design criteria calls for an accordion-pleated tank to be made of elastomer coated nylon fabric with ten 60 degree v-shaped pleats with a cross section of 14 inch by 24 inch and holding about 18 gallons of fluid. This tank could collapse to fit a much more restrictive space and can actually expand to 21 inches to provide a capacity of nearly 25 gallons. The results showed that a tank of the specified materials provides an acceptable and versatile holding tank for upgrading a sanitary system on small pleasurecraft, particularly in the 22 to 28 foot length.

PB-201 701
Allis-Chalmers Mfg. Co., Milwaukee, Wis. Research Div.
MUNICIPAL SEWAGE TREATMENT WITH A ROTATING BIOLOGICAL CONTACTOR.
Final rept.,

May 69, 66p W71-10655, FWPCA-17050-DAM-05/69
Contract FWPCA-14-12-24

Descriptors: (*Sewage treatment, *Contactors), Biochemical oxygen demand, Microorganisms, Nitrogen, Phosphorus, Particles, Clarification.

The Milwaukee Metropolitan Sewerage Commission installed a rotating biological contactor (RBC) to treat municipal sewage. The RBC obtained in excess of 90% BOD removal at loading rates of 350 to 400 lbs COD per day per 1000 cu. ft. of disc volume. Nitrogen was shown to be removed in a ratio of 1:25, nitrogen to COD. Percent BOD removal was consistently 5% greater than percent COD removal. Treatment efficiency was increased with increased detention time, and decreased by: (1) lower disc speed; (2) lower strength wastes; and (3) high hydraulic loading. Recovery from periods of high hydraulic loading was extremely quick. Further planned investigations included isolation and identification of individual species of microorganisms and comparison with the microorganisms of activated sludge and trickling filters. (WRSIC abstract)

PB-201 724
Pacific Northwest Water Lab., Corvallis, Oreg.

BENEFICIAL USES OF WASTE HEAT - AN EVALUATION,
Roland R. Garton, and Alden G. Christianson. Sep 70, 11p W71-10748 EPA-WQO-16130-FHJ-09/70
Presented at Conference on Beneficial Uses of Thermal Discharges. Sponsored by New York State Dept. of Environmental Conservation, Albany, New York, 18 September 1970.

Descriptors: (*Water pollution, *Heat), (*Cooling water, Utilization), Evaluation, Aquaculture, Ecology, Economic analysis.
Identifiers: *Thermal pollution.

Discussed are a number of proposed beneficial uses of waste heat contained in power plant cooling water. Included are those for which the technical feasibility has been demonstrated in pilot programs and those which are, at best, imaginative ideas. Primary concern is with solving the environmental pollution problem. Seen from this standpoint, a beneficial use must help reduce the thermal pollution problem directly or must provide a profit to help off-set the cost of cooling devices. The use must not result in additional pollution such as that resulting from untreated organic wastes. Some uses, such as the culture of certain fishes, are now at the pilot program, or even commercial, stage. Other uses, such as for industrial processes, require additional research. Integrated systems planned to produce steam as well as electrical power have been successful in special situations. In nearly all cases additional information is needed on the overall economics of proposed methods. This is especially true where high quality heat is taken directly from the power plant steam cycle for another use. Only with a complete economic analysis, including cost of distribution and waste treatment, can the final decision be made as to whether a 'beneficial use' is truly beneficial in the long run. (Author)

PB-201 725
Black, Crow and Eidsness, Inc., Atlanta, Ga.
STORM AND COMBINED SEWER POLLUTION SOURCES AND ABATEMENT, ATLANTA, GEORGIA.

Jan 71, 184p W71-10749, EPA-WQO-11024-ELB-01/71
Contract FWQA-14-12-458

Descriptors: (*Storm sewers, Water pollution), (*Combined sewers, Water pollution), (*Urban planning, *Georgia), Abatement, Overflows, Storms, Surface water runoff, Waste water, Waste treatment, Benefit cost analysis, Sources, Water quality, Water storage, Biochemical, Oxygen demand, Urban areas.
Identifiers: Atlanta (Georgia), *Water pollution control.

Six urban drainage basins in Atlanta, Georgia, served by combined and separate sewers, were studied to determine the major pollution sources during storm events. Rainfall frequency analysis and simulation techniques were utilized to obtain design criteria for alternative pollution abatement schemes. High frequency storms cause the worst impact and most of the pollution from combined sewer areas. Annual BOD from these areas is 2,078,000 pounds, or 460 lbs/acre, of which 57 percent is due to storms of two--week or higher frequency. Bypassing of wastewater treatment plant flows during storms adds 690,000 pounds BOD/year. Runoff from storm--sewered areas, at 253 lbs/acre, adds 5,577,000 pounds/year. Overflows and bypassed flows have severe impact upon the South River, due to their high deoxygenation rates and coliform concentrations. Annual BOD reduction from combined sewer areas of 57 percent may be achieved for a total annual cost of $165,000, by modifying the three regulators and treating 80 percent of the overflows, in conjunction with storage sufficient to contain a two--week storm. (Author)

PB-201 726
California Univ., Berkeley.
SELECTIVE WITHDRAWAL FROM A STRATIFIED RESERVOIR,
Jorg Imberger, and Hugo B. Fischer. Dec 70, 166p W71-10750, EPA-WQO-15040-EJZ-12/70
Paper copy available from GPO $1.00 as EPA 15040 EJZ 12/70.

Descriptors: (*Reservoirs, Fluid flow), (*Water quality, Mathematical prediction), Stratification, Density, Model tests, Boundary layer flow, Thickness, Dyes, Isotopic labeling, Mathematical models, Hydraulic gradients, Density (Mass/Volume), Interfaces.
Identifiers: Stratified reservoirs, Selective withdrawal.

The study describes both theoretically and experimentally the flow into a line sink in a linearly density stratified reservoir. The geometry of the boundaries is simplified to a parallel walled duct with the line sink at the center of the fluid. The primary focus is on partitioning the flow into distinct flow regimes, and predicting the withdrawal layer thickness as a function of the distance from the sink. Laboratory experiments verified the conclusions reached from the theoretical considerations. The withdrawal layer thicknesses were shown to be closely predicted by the integral solution. Comparison with measurements made by the Tennessee Valley Authority indicates that in a reservoir the withdrawal layers are approximately one and a half times as large as predicted. The difference in thickness is probably explained by the presence of a certain amount of turbulence in the reservoir, and interference by the rear boundary of the reservoir. (WRSIC abstract).

PB-201 736
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
ATMOSPHERIC CONTAMINATION AND TRIBO ELECTRIFICATION.
Final rept., 1 Jun 68-31 May 70,
Edward E. Weaver, and Clyde Orr, Jr. 31 May 70, 46p GIT-B-366 APTD-0629
Grant PHS-AP-77741-02

Descriptors: (*Electrostatic charge, Friction), Static electricity, Air pollution, Humidity, Gases, Vapors, Surface chemistry.
Identifiers: Triboelectric effect

Tribo electrification between various substrates and platinum was investigated with a number of gases, vapors, and gas mixtures present in order to determine the effects of humidity and gaseous pollution and to investigate the mechanisms of frictional charging. The substrates were formed into discs and rotated against platinum in a chamber which could be evacuated and filled with any gas or gas mixture at pressures up to atmospheric over a range of temperatures. Results confirmed that in pure air, water vapor exerts a predominant influence on electrostatic charging and suggested that a maximum occurs in the generated voltage conditions such that a layer of adsorbed water a very few molecules thick was present. Other experiments indicated that, in the presence of air, most pollutant gases had only a slight effect on the voltage generated. In the presence of air, no gases were found that caused an increase in tribo electrification. (Author)

PB-201 737
General Research Corp., Santa Barbara, Calif.
FURTHER DEVELOPMENT OF THE PHOTOCHEMICAL SMOG MODEL FOR THE LOS ANGELES BASIN.
Final rept.,
A. Q. Eschenroeder, and J. R. Martinez. Mar 71, 66p GRC-CR-191-1 APTD-0678

Descriptors: (*Air pollution, *Atmospheric diffusion), (*Smog, *Atmospheric motion), Photochemical reactions, Nitrogen oxides, Mathematical models, Reaction kinetics, Ozone, Mixing.

Results of research conducted on the further development of an earlier atmospheric diffusion model are presented. The work has resulted in a diffusion model with photochemistry that is applicable to pollutants that undergo chemical changes. The techniques used in the report have been advanced to the stage where they can be adapted to the planning and implementation of air pollution abatement measures. The photochemical description has been extended to account for varying ratios of nitrogen to hydrocarbon. Some hypotheses of carbon monoxide interactions have been tested. Descriptions are given also of numerical integration improvements, and of refinements in the meteorological realism of the model. Finally, the paper presents validation tests for Los Angeles basin data and the significance of the results are discussed in terms of future applications of the technique. (APCO Abstract)

PB-201 738
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
IDENTIFICATION AND ESTIMATION OF IONS, MOLECULES, AND COMPOUNDS IN PARTICULATE MATTER COLLECTED FROM AMBIENT AIR.
Final rept., 30 Jun 70-30 Jun 71,
E. R. Blosser, and W. M. Henry. 23 Jul 71, 77p* APTD-0705
Contract EPA-CPA-70-159

Descriptors: (*Air pollution, Chemical analysis), (*Particles, Air pollution), Gas filters, X ray diffraction, Mass spectra, X ray fluorescence, Oxygen, Metals, Urban areas.
Identifiers: *Air pollution detection.

Methods have been developed and applied to ambient air particulate samples to identify and estimate elements and compounds. Preliminary to compound identification, the elemental analyses of some 74 samples collected on filters were obtained using a variety of methods. Oxygen analyses were made using a sample collected on a silver filter; X-ray diffraction studies were performed on samples removed from all-nylon filters, and on density separated fractions of these samples. (Author)

PB-201 739
Environmental Protection Agency, Durham, N.C. Air Pollution Control Office.
SECONDARY ZINC INDUSTRY EMISSION CONTROL PROBLEM DEFINITION STUDY. PART I. TECHNICAL STUDY.
Final rept.,
William O. Herring. May 71, 150p* APTD-0706

Descriptors: (*Metal industry, Air pollution), (*Zinc inorganic compounds, *Air pollution), Metal scrap, Zinc oxides, Zinc chlorides, Materials recovery, Metallurgical furnaces, Particles, Economic analysis, Impurities.
Identifiers: *Zinc industry, *Air pollution control.

Effluents containing particulate and gaseous emissions are exhausted from certain processes of the secondary zinc industry. Data on those emissions with related emission-control and process data were obtained from a sampling of plants. These data were evaluated to obtain the results of this study. Emissions from sweat processes occur at very low rates where the processed zinc scrap contains only small amounts of impurities. However, very significant emissions of particulate and gaseous carbonaceous substances, and particulate zinc oxide and zinc chloride may occur when there are substantial amounts of impurities in the scrap. The results of this study indicate that emission factors for zinc sweat processes range from zero to around 32 pounds of particulate per ton of scrap material processed. The results further indicate that the emitted particulate may be composed of zero to 34 percent $ZnCl_2$; 40 to 100 percent ZnO; and small percentages of carbonaceous substance. Several emission-control concepts were developed based on findings of the study, and recommenda-

tions are made for further research and development. (Author)

PB-201 745
Acoustica Associates, Inc., Los Angeles, Calif.
DEMONSTRATE FEASIBILITY OF THE USE OF ULTRASONIC FILTRATION IN TREATING THE OVERFLOWS FROM COMBINES AND/OR STORM SEWERS.
Final rept.

22 Sep 67, 94p W7110654 FWPCA-11020-09/67
Contract FWPCA-14-12-23

Descriptors: (*Sewage treatment, Filtration), (*Water treatment, Filtration), (*Ultrasonic cleaning, *Filtration), Backwashing, Combined sewers, Storm sewers, Feasibility studies, Algae, Colloids, Cost estimates, Sedimentation, Particle size.

The feasibility, both economic and technical, of using ultrasonic filtration as an aid to removing suspended impurities was investigated. Inputs to the test apparatus included drinking water, simulated sewage, primary and secondary sewage effluents, algae pond effluent, coarsely screened, raw sewage diluted 2:1, 5:1, and 10:1 with simulated storm drainage, and deliberately concentrated raw sewage. Dirt, sand, and leaves were added in some test runs with no apparent effect on performance. 20 and 50 micron filter elements, operated at approximately 10 gpm/sq ft2 with head losses from 1 to 4 psi, reduced the BOD and suspended solids of raw sewage diluted in varying degrees with water by an average of 40 and 70% respectively. System performance was intermediate between that of primary and secondary treatment. Other benefits included: Application of ultrasonic energy increased the total quantity of effluent filtered between backwash cycles; from 4 to 18 times that treated with similar equipment without ultrasonics applied; and Application of ultrasonic energy restored the filter elements to 'like-new' condition without necessitating frequent filter replacement. Cost figures for an ultrasonic filtration system capable of handling 1.4 mgd, exhibiting performance midway between primary and secondary treatment, and occupying only several hundred square feet, ranged between 2.8 and 3.5 cents/ 1000 gallons. By comparison, combined primary-secondary treatment cost figures were reported as 10 cents/1000 gallons excluding the cost of the considerable amount of land involved. (WRSIC abstract)

PB-202 112
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
STORAGE AND HANDLING DEVICES FOR RADIUM.
Jun 71, 14p BRH/DMRE-71-3
Paper copy available from GPO $0.30 as SN1715-0019.

Descriptors: (*Radium isotopes, Materials handling), (*Radioactive materials, *Radiation shielding), Lead coatings, Concretes, Radiation protection, Shipping containers.
Identifiers: Radium 226.

Difficulties met during radium storage and research operations have resulted in the development of many new and improved handling techniques for radium-226 sources. These innovations include several devices and methods that reduce personnel exposure during handling and storage of radioactive materials. (Author)

PB-202 165
Bureau of Mines, Washington, D.C.
FEASIBILITY STUDY OF THE AVAILABILITY OF INTERNATIONAL PETROLEUM SUPPLY DATA.

Apr 71, 50p APTD-0716

Descriptors: (*Petroleum industry, *Economic surveys), Crude oil, Petroleum refining, Sulfur, Petroleum transportation, Statistical data, Residual oils, Consumption, Supply (Economics), Demand (Economics), International trade.
Identifiers: International petroleum supply.

A complete inventory was performed to determine the availability of source materials which provide supply-demand statistics for foreign countries. Special effort was made to determine the availability of sources which report the sulfur content of crude oil and residual fuel oil. The inventory revealed that approximately 500 publications must be perused for extractive data in order to obtain annual foreign petroleum supply and demand statistics. This report presents an evaluation of available source material on: crude oil reserves; crude oil production; crude oil refined products trade; refining capacity and production; refined products consumption and international bunkering. An analysis is presented of foreign refineries and transport problems. (Author)

PB-202 166
Bureau of Mines, Washington, D.C.
UNITED STATES COAL RESOURCES AND PRODUCTION.
Interim rept.

Jun 71, 51p APTD-0713

Descriptors: (*Coal deposits, *Production capacity), (*United States, Coal deposits), Bituminous coal, Subbituminous coal, Lignite, Anthracite, Ash content, Sulfur, Coal mining.

Data are compiled in this report on the total remaining coal resource of the United States, the production of coal in 1970 by mining method, sulfur content, ash content, and BTU value. Production of all coal has been projected to 1976. Projections have also been made in three sulfur categories: less than 1.0 percent, 1.0 to 2.0 percent, and 2.1 percent or more sulfur. The total remaining coal resource of the United States, as of December 31, 1970, is estimated at 1,576 billion tons, consisting of 693 billion tons of bituminous coal, 420 billion tons of subbituminous coal, 447 billion tons of lignite, and 16 billion tons of anthracite. (Author)

PB-202 167
Bureau of Mines, Washington, D.C.
TRANSPORTATION COSTS OF FOSSIL FUELS.
Interim rept.
Jun 71, 62p APTD-0714

Descriptors: (*Transportation, *Cost analysis), (*Fossil fuels, Transportation), Coal, Natural gas, Residual oils, Rail transportation, Waterway transportation, Statistical data.

The report delineates some of the important factors relating to the costs of transporting fossil fuels from regions of production to sites of consumption. The costs of shipping coal have been presented in a quantified fashion for selected producing area to areas of consumption. The costs of shipping residual fuel oil and natural gas from domestic and foreign sources to New York and San Francisco Standard Metropolitan Statistical Areas are also provided. The collected transportation data were stratified to determine the general effects stratification had upon transportation costs. Economics of haul for coal do exist for longer versus shorter distances, larger trainload versus smaller trainload sizes, and company-owned car ownership versus railroad car ownership. Most of the rates for the longer voyages for the tanker and barge transportation of residual oil also show economies of haul. (Author)

PB-202 168
Bureau of Mines, Washington, D.C.
RESTRICTIONS ON THE USES OF COAL.
Jun 71, 61p APID-0717

Descriptors: (*Coal, Availability), (*Economic forecasting, Coal), Limiting, Coal constituents, Air pollution, Transportation, Coal preparation, Coal mining, Manpower, Safety.

Although the United States has virtually unlimited reserves of coal of all ranks, the future availability of domestic coals may be limited by factors which range from the inherent characteristics of the coal itself to the nation's capacity for producing and transporting a high grade product suitable for various end-use markets. In addition to coal's quality characteristics that may restrict its use in certain markets, other limiting factors such as manpower and transportation availability, and inadequate mine production and preparation and cleaning plant capacity are indirectly related to coal supply and availability. Each of these constraints were evaluated in this report and an attempt was made to show their quantitative effect upon the future consumption and use of coal. (Author)

PB-202 196
Solar, San Diego, Calif.
LOW EMISSION BURNER FOR RANKINE CYCLE ENGINES FOR AUTOMOBILES.
Final rept. 1 Jul 70-31 Mar 71,
T. E. Duffy, J. R. Shekleton, R. T. LeCren, and W. A. Compton. 31 Mar 71, 167p RDR-1695
APTD-0707

Descriptors: (*Combustion chambers, *Exhaust emissions), (*Automobile engines, *Rankine cycle), Air pollution control equipment, Design criteria, Fuel systems, Fuel sprays, Flowmeters, Fans, Combustion control.
Identifiers: JP-5 fuels, Air fuel ratio.

A program has been initiated with the primary objective of applying modern analytical and experimental techniques to the design and demonstration of a low emission combustor for an automotive Rankine engine. The basic problem resolved by this program was the demonstration that a Rankine cycle combustor with a two million BTU per hr. heat release in a 1.33 cu. ft. volume operating on JP-5 fuel can meet the 1980 Advanced Automotive Power Systems emission level goals over a 100 to 1 heat release range at steady state or during rapid transients. The program has further demonstrated that the package size and power requirements of combustors need not be excessive. The novel fuel automization system assures that the fuels can be rapidly ignited in even the coldest weather and does not need warm up to maintain low emission as do the current spark ignition engines. The novel rotating cup has been shown to be essential for low emission control over the 100 to 1 heat release range. The precision air and fuel metering valves and controls have also been shown to be essential to maintain the low emissions over the 100 to 1 heat release range. (Author)

PB-202 202
Snell (Foster D.), Inc., Florham Park, N.J.
ORGANIC PESTICIDES AND PESTICIDE CONTAINERS. A STUDY OF THEIR DECONTAMINATION AND COMBUSTION,
Robert C. Putnam, Frank Ellison, Robert Protzmann, and John Hilovsky. 1971, 182p EPA-SW-21C-71
Contract EPA-CPE-69-140

Descriptors: (*Pesticides, *Waste disposal), Decontamination, Combustion, Containers, Oxidizers, Binders (Materials), Pyrolysis, Polyethylene, Environments, Pollution.

The problem of the disposal of waste pesticides is constantly increasing in acuteness with the diversification of their use and the growth of population. Their escape into the environment as a result of disposal practices must be controlled or prevented. Some waste pesticides are being stored until safe disposal methods are available; however, they cannot be accumulated indefinitely. The purpose of this project was to investigate methods of combustion applicable to disposal of pesticide

residues and their containers and to devise a means for their destruction that would keep environmental pollution to a minimum. Oxidizing agents and binders generally aided the destruction of pesticides; the combination of oxidants and petroleum oil binders was no more effective than the oil binders alone. By using polyethylene, which under heating or combustion conditions softens or degrades to products of lower molecular weight, the advantages of a liner and a binder were obtained with one material. A practical system was devised that consisted of burning the pesticide in a flattened polyethylene bag on or surrounded by other combustible material. Suggestions were made concerning an improved design of polyethylene container or liner to aid in carrying out the purpose of this investigation.

PB-202 220
National Air Pollution Control Administration, Raleigh, N.C.
LARGE POWER PLANT EFFLUENT STUDY (LAPPES). VOLUME II. INSTRUMENTATION, PROCEDURES, AND DATA TABULATIONS (1967 AND 1969),
Francis A. Schiermeier. Nov 70, 347p APTD-0589
See also Volume I, PB-194 152. Released to the public Aug 1971.

Descriptors: (*Air pollution, *Combustion products), (*Electric power plants, Air pollution), (*Plumes, *Atmospheric motion), (*Sulfur dioxide, Air pollution), Tables (Data), Flue gases, Coal, Thermal power plants, Airborne detectors, Plume detection, Climatology, Meteorological data, Monitors, Pennsylvania.
Identifiers: *LAPPES (Large Power Plant Effluent Study), Large power plant effluent study, Indiana County (Pennsylvania).

The Large Power Plant Effluent Study (LAPPES) was initiated in Western Pennsylvania to evaluate the extent and effects of air pollution resulting from the largest complex of coal-burning generating stations in the United States. During 1967 and 1969 three series of LAPPES field experiments were conducted in an area surrounding the Keystone and Homer City Generating Stations; these experiments consisted of ground-based and airborne plume measurements supported by extensive meteorological observations. The topography and climatology of the generating station complex, the sulfur dioxide and meteorological monitoring equipment, and experimental procedures are described. Plant operational parameters and air quality and meteorological data collected during 1967 and 1969 are tabulated. (Author)

PB-202 221
Esso Research Centre, Abingdon (England).
STUDY OF CHEMICALLY ACTIVE FLUID BED GASIFIER FOR REDUCTION OF SULPHUR OXIDE EMISSIONS.
Interim rept. 22 Jun 70-22 Feb 71,
J. W. T. Craig, G. L. Johnes, G. Moss, and J. H. Taylor. 22 Feb 71, 92p APTD-0721
Contract EPA-CPA-70-46

Descriptors: (*Fuel oil, *Desulfurization), (*Limestone, *Adsorbents), (*Air pollution, Sulfur dioxide), (*Sulfur inorganic compounds, *Adsorption), (*Fluidized bed processors, *Air pollution control equipment), (*Furnaces, Air pollution control equipment), Calcium oxides, Gasification, Vanadium, Materials recovery, Design, Combustion, Sodium, Iron, Gasification, Great Britain.
Identifiers: *Chemically Active Fluid Beds, *Air pollution control.

Exploratory work previously had shown a range of conditions under which sulfur is trapped by a shallow fluidized bed of lime in which fuel oil is undergoing partial combustion and gasification. The possibility of regenerating the lime had also been demonstrated. Thus the framework had been established for a process to eliminate SO2 pollution during combustion of high sulfur fuel oils. The process is designated CAFB for Chemically Active Fuel Bed. Batch reactor studies have extended the understanding of the Chemically Active Fluid Bed (CAFB) gasification process, the effects of its variables, and some of its limitations. A US fuel oil and one US limestone (BCR 1691) have been found to be satisfactory for the (CAFB) process, but a second US stone (BCR 1690) is not favorable. Two new batch reactors have been constructed. The adsorption of iron, vanadium, and sodium from the fuel by the limestone is mentioned. (Author)

PB-202 227
Robert S. Kerr Water Research Center, Ada, Okla.
DETERMINATION OF POLLUTIONAL POTENTIAL OF THE OGALLALA AQUIFER BY SALT WATER INJECTION,
Leslie G. McMillion, Sr., and Bruce W. Maxwell. Jun 70, 90p W71-11361, EPA-FWQA-16060-6/70

Descriptors: (*Ogallala aquifer, *Water pollution), (*Injection wells, Water pollution), (*Brines, *Waste disposal), Oklahoma.
Identifiers: *Liquid waste disposal, *Oil wastes.

Field studies were conducted to determine whether contamination of the Ogallala Aquifer could result from the current practice of injection of oil-field brines into the Glorieta Sandstone, which lies 500 to 1,000 feet below the Ogallala in Texas County, Oklahoma--the study area. The project was designed on the basis that for brines to move from the Glorieta to the Ogallala the potentiometric pressures in the Glorieta would have to be higher than water-level elevations of the Ogallala. Since the hydraulic characteristics of the Glorieta Sandstone were needed for determining this fluid relationship, a technique was developed for making aquifer tests in brine disposal wells. The technique has application in certain water resources investigations and in situations similar to that of this study. (Author)

PB-202 230
Midwest Research Inst., Kansas City, Mo.
LIGHT-CATALYZED CHLORINE OXIDATION FOR TREATMENT OF WASTEWATER,
Alfred F. Meiners. Sep 70, 118p W7111364, EPA-WQO17020-DUE-09/70
Contract DI-14-12-531
Paper copy available from GPO $1.00 as stock no. EP2.10:17020-DUE-09/70, 5501-0076.

Descriptors: (*Sewage treatment, *Photochemical reactions), (*Chlorination, Sewage treatment), Ultraviolet radiation, Performance evaluation.

The purpose of this research effort was to determine the feasibility of applying the light-catalyzed chlorine oxidation process to the treatment of effluents from secondary waste-treatment plants. Studies were made of wavelength effects and intensity-time effects for the purpose of selecting the most practical source of radiant energy for the process. A batch-recycle reactor was constructed to establish certain plant-design parameters for low-pressure mercury arcs under conditions which simulated large-scale operations. Cost estimates were made for the application of this process to a plant producing 10 million gallons of effluents per day. (Author)

PB-202 231
North Star Research and Development Inst., Minneapolis, Minn.
USE OF FUNGI IMPERFECTI IN WASTE CONTROL.
Water pollution control research series,
Brooks D. Church, and Harold A. Nask. Jul 70, 91p W71-11365, FWPCA-12060-EHT-07/70
Paper copy available from GPO $1.00 as stock no. EP2.10:12060EHT/07/70.

Descriptors: (*Food processing, *Industrial waste treatment), (*Biodeterioration, Industrial waste treatment), Fungi.
Identifiers: *Corn processing, *Soybean processing.

Forty-five species of twelve genera of the Fungi Imperfecti were screened for those fungal candidates best able to rapidly convert soluble and suspended organic material (as measured by BOD) from corn- and soy food-processing waste streams to mycelial protein. Rapidly growing fungal strains were selected which were readily removed from the digested waste effluents by coarse filtration. Results on both soy and corn wastes gave definite encouragement that the commercial use of selected strains of certain species of Fungi Imperfecti to remove BOD in a readily harvested form is practical.

PB-202 234
Pacific Northwest Water Lab., Corvallis, Oreg.
SECONDARY TREATMENT OF POTATO PROCESSING WASTES.
Water pollution control research series,
Kenneth A. Dostal. Jul 69, 68p W71-11369, EPA-WQO-12060-07/69
Paper copy available from GPO $0.65 as stock no. EP2.10:12060.07/69.

Descriptors: (*Food processing, *Industrial waste treatment), (*Lagoons (Pond's), Industrial waste treatment), Aerobic processes, Performance evaluation.
Identifiers: *Potatoe processing, *Water pollution control, Aeration ponds.

The report presents the results obtained from three pilot lagoons which were used to treat potato wastes during the period October 1966 through June 1968. One of the lagoons received primary clarifier effluent and was operated as a surface-aerated, aerobic unit. A second pond also received clarifier effluent but was operated as a completely-mixed, covered anaerobic unit. The effluent from the anaerobic unit was pumped into a third pond which contained a surface aerator. Hydraulic and organic loadings were varied to yield a spectrum of results. These results give feasible methods of secondary treatment of potato processing wastes.

PB-202 236
Dodson, Kinney and Lindblom, Columbus, Ohio.
EVALUATION OF STORM STANDBY TANKS, COLUMBUS, OHIO.
Water pollution control research series,
C.T. Lindblom. Mar 71, 120p W71-11371, EPA-WQO-11020-FAL-03/70
Paper copy available from GPO $1.50, as stock no. EPI.16:1102-FAL-03/71.

Descriptors: (*Combined sewers, *Water storage), Flow rate, Design.
Identifiers: *Storm water runoff, *Water pollution control.

The operation of three storm standby tanks contiguous to an intercepting sewer which serves both combined sewers and sanitary sewers was investigated to determine the effectiveness of the tanks in improving the quality of the waste water prior to its discharge into the river. Based on influent and effluent sampling data collected during the study period, storm standby tank facilities reduce significantly concentration of the solids and B.O.D. in the waste water in storm runoff periods. The extent of reduction is dependent to a major degree on the detention time of flow passing through the tanks. Improvement of dissolved oxygen resulting from passage of waste water through the tanks is very substantial, especially during periods when the dissolved oxygen content of the influent is low. (Author Modified Abstract)

PB-202 237
North Star Research and Development Inst., Minneapolis, Minn.

NEW AND ULTRATHIN MEMBRANES FOR MUNICIPAL WASTEWATER TREATMENT BY REVERSE OSMOSIS.
Water pollution control research series,
L. T. Rozelle, E. M. Scattergood, B. R. Nelson, and J. E. Cadotte. Oct 70, 65p W71-11372, EPA-WQO-17020-EFA-10/70
Contract DI-14-12-587
Paper copy available from GPO $0.70 as stock no. EP2.10:17020-EFA-10/70, 5501-0073.

Descriptors: (*Sewage treatment, *Osmosis), (*Membranes, Osmosis), Cellulosic resins, Sulfonic acids, Performance evaluation.
Identifiers: *Reverse osmosis, *Tertiary sewage treatment.

A series of new and ultrathin membranes with thicknesses from 250 to 5000 angstroms and consisting of various polysaccharide mixed esters and ethers were tested on microporous supporting films for improved reverse osmosis treatment of municipal wastewaters. From the screening studies with secondary effluent, ultrathin membranes prepared from two polymers (out of a total of 44) looked very promising: cellulose methyl sulfonate O-propyl sulfonic acid (CMSOPSA) and cellulose acetate O-propyl sulfonic acid (CAOPSA). Long-term (150 hours) testing of the CMSOPSA membrane with secondary effluent resulted in an average water flux of 34 to 36 gfd over the last 100 hours, and rejections of 96 percent for total dissolved solids, 94 percent for ammonia, and 83 percent for total organic carbon. Preliminary membrane optimization studies showed that the reverse osmosis properties of these new membranes could be improved by closely controlling the polymer preparation procedures and the casting and annealing conditions. A preliminary economic analysis was conducted.

PB-202 238
Coca-Cola Co., Orlando, Fla. Foods Div.
TREATMENT OF CITRUS PROCESSING WASTES.
Water pollution control research series,
James B. Goodson, and Jack J. Smith. Oct 70, 193p W71-11373, EPA-WQO-12060-10/70
Grant FWPCA-WPRD-38-01-67
Paper copy available from GPO $2.75 as stock no. EP2.10:12060-10/70.

Descriptors: (*Food processing, *Industrial waste treatment), (*Lagoons (Ponds), Industrial waste treatment), Sewage treatment, Aerobic processes.
Identifiers: *Citrus fruit processing, *Water pollution control, Aeration ponds.

Plant scale studies were performed to determine operational and treatment parameters for citrus processing wastewaters. Part I discusses treatment of concentrated citrus processing wastwaters combined with domestic sewage using a modified activated sludge process; namely, extended aeration. Part II discusses treatment of weak processing wastewaters using a system which functioned as an aerated lagoon. (Author Modified Abstract)

PB-202 256
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
EFFECTS OF FUEL ADDITIVES ON AIR POLLUTANT EMISSIONS FROM DISTILLATE-OIL-FIRED FURNACES,
G. B. Martin, D. W. Pershing, and E. E. Berkau.
Jun 71, 91p AP-87
Paper copy available from GPO $0.50 as stock no. 5503-0021.

Descriptors: (*Air pollution, *Combustion products), (*Fuel additives, Air pollution), (*Fuel oil, Fuel additives), (*Furnaces, Air pollution), Particles, Nitrogen oxides, Oil burners, Tests, Evaluation.
Identifiers: *Air pollution control.

The available literature was surveyed, and samples of all known additives procured. Each additive was analyzed for elemental composition to provide a basis for testing. A standard screening procedure was established to test the effect of each additive on emissions from fuel oil combustion. Screening tests were carried out on all distillate soluble additives. The most promising additives were then subjected to a rigorous examination. Fuel additives are not a promising way of reducing air pollution from distillate oil combustion. A majority of the additives tested had no beneficial effects on air pollutant emissions; in fact, some additives even increased total particulate and NO (X) emissions. Several of the metal-containing additives, e.g., Ferrocene, CI-2, and Fuelco SO3, reduced total particulate emissions; however, the unknown toxicity of new emissions they create makes their use questionable. Further, there is evidence that for distillate oils, burner modifications are a more suitable route to air pollution control. (Author)

PB-202 268
Sign X Labs., Inc., Essex, Conn.
PLUME RISE FROM KEYSTONE PLANT.
Final rept.,
Betsy Woodward Proudfit. Dec 70, 90p
APTD-0727
Contract PH-86-68-94
Released to the public Aug 71.

Descriptors: (*Air pollution, *Combustion products), (*Electric power plants, Air pollution), (*Plumes, *Atmospheric motion), Sulfur dioxide, Temperature, Atmospheric concentration, Airborne detectors, Wind (Meteorology), Meteorological data, Pennsylvania.
Identifiers: *Keystone Generating Station, LAPPES (Large Power Plant Effluent Study), Air pollution detection, Indiana County (Pennsylvania).

An instrumented helicopter was used to obtain a record of temperatures and sulfur dioxide concentration in the plume from the Keystone Power Plant in western Pennsylvania. The records were then evaluated to determine plume heights under a variety of atmospheric conditions. To assist in determining the plume boundaries, a device was used which detected charged particles in the plume. The equipment and techniques used to obtain the data and the methods employed to reduce it are described. The data from ten flight days are presented. Included are general descriptions of each day, temperature soundings and plume heights and SO2 maximum concentrations obtained from traverses through the plume. Twenty cases from seven flight days were analyzed and evaluated. For the cases analyzed, the average wind speed varied from 4.8 to 12.5 meters per second and the stability from about 0.15 to 1.5 degrees C. per 100 meters.

PB-202 281
Bureau of Mines, Washington, D.C.
OIL AVAILABILITY BY SULFUR LEVELS.

Aug 71, 282p* APTD-0731

Descriptors: (*Crude oil, Availability), (*Fuel oil, Availability), Surveys, Sulfur, Reserves, Refineries, Desulfurization, International trade, Bulk storage, Oil storage, Pollution.

Sulfur content of crude oil reserves, production, and selected refined products are presented by geographical areas. Crude oil reserves (as of December 31, 1969) and 1969 production were classified by sulfur content as were refinery receipts. Quantity and sulfur content of stocks and shipments of selected refinery products was determined; also tabulated was sulfur content of stocks held at bulk terminal storage facilities. Domestic and foreign desulfurization operations were tabulated and technology discussed. Pertinent data for reserves, production, refineries, and bulk terminals were incorporated into a computerized national energy data bank.

PB-202 345
TRW Systems Group, McLean, Va. Washington Operations.
DEMONSTRATION OF A REGIONAL AIR POLLUTION COST/BENEFIT MODEL.
Jul 71, 292p* 11130-W004-R0-00 APTD-0722
Contract PH-22-68-60
See also PB-202 353.

Descriptors: (*Air pollution, *Benefit cost analysis), Computer programs, Abatement, Management planning, Economic models, Regional planning, Systems analysis, Data acquisition, Economic analysis, Computerized simulation, Cost estimates.
Identifiers: *Air pollution control, *Regional Air Pollution System Analysis, Implementation Air Pollution Planning Program.

A program is presented which had as its objectives the design, assembly and delivery of analytic tools to be used in regional and national air pollution planning and management. The Cost/Benefit model described here completes a set of computer programmed air pollution analysis tools previously conceived. The completed project combines the results of systems analysis with cost/benefit analysis. A description is given of the programmed Benefits Model Segment, a user's manual, and the results of a study which was conducted to illustrate the operation characteristics of the Cost/Benefit Model. The various component modules of the Implementation Planning program and the Benefits model segment are presented. Also included is a presentation of the model demonstration in the National Capitol Interstate control region.

PB-202 346
Pacific Northwest Water Lab., Corvallis, Oreg.
TRACE MATERIALS IN WASTES DISPOSED TO COASTAL WATERS: FATES, MECHANISMS AND ECOLOGICAL GUIDANCE AND CONTROL,
Milton H. Feldman. Jul 70, 107p Working Paper-78 w71-11793, FWQA-16070-07/70

Descriptors: (*Marine biology, *Trace elements), (*Water pollution, *Ecology), Metabolism, Oceans, Coasts, Lead, Cyanides, Mercury, DDT, Metals, Algae, Toxicity, Seawater, Nutrients, Nitrogen, Phosphorus, Magnesium, Manganese, Reviews.
Identifiers: Eutrophication, *Water pollution effects (Plants), *Water pollution effects (Animals).

Wastes currently being discharged to the coastal waters of the United States include Trace organic contaminants (TC), trace elements (TE), and other trace materials (TM). Those TM dealt with included: (1) known violently noxious materials (Pb (+2), (CN)2 (-2), Hg (+2)); (2) materials which are biostimulatory to some species (cobalamin, iron chelates, thiamin, biotin, Mn, Mg; and (3) materials which are bioinhibitory for at least some species in various mechanisms (DDT, Se, Mn, Mg). A different view of the problem was taken in which ways of selecting the optimum organism to utilize a particular waste were preferred to methods of removing it conventionally. A thorough literature search revealed a significant lack of literature in waste breakdown for both qualitative and quantitative evaluation. It was concluded that further studies should be performed for each known trace material to determine: The mechanism whereby it is secluded; The metabolic threshold; The active level; The harmful level; The speciation requirements; The absolute rates in and out of the compartments of which coastal waters, sediments, chemical system phases, and biota may be considered as composed. Evaluations such as these were performed for DDT, and they must be performed for the known set of waste constituents before rational action to prevent damage to the oceans is possible.

PB-202 353
TRW Systems Group, McLean, Va. Washington Operations.

A MODEL FOR REGIONAL AIR POLLUTION COST/BENEFIT ANALYSIS,
Kenneth R. Woodcock. May 71, 161p* 11130-W001-R0-00 APTD-0708
Contract PH-22-68-60
See also PB-202 345.

Descriptors: (*Air pollution, *Benefit cost analysis), Computer programming, Economic models, Economic analysis, Cost estimates, Abatement, Sulfur dioxide, Particles, Management planning, Decision theory.
Identifiers: *Air pollution control, *Regional Air Pollution System Analysis, Implantation Air Pollution Planning Program.

A description of a cost/Benefit model is presented. This model is an extension of the Implementation Planning Program, a cost-effectiveness model which has been utilized in evaluating regional emission control strategies for the development of implementation plans. The specifications for the model for sulfur dioxide and particulate pollutants have been developed and are presented. The report also focuses on: The need for analytical procedures to evaluate the economic consequences of air pollution control strategies the identification of additional research areas which need consideration; A theoretical discussion of economic efficiency and equity considerations of air pollution control strategies; and Model utilization in the air pollution control decision-making process.

PB-202 363
Bureau of Mines, Pittsburgh, Pa. Mineral Supply.
ANALYSIS OF THE AVAILABILITY OF BITUMINOUS COAL IN THE APPALACHIAN REGION.

Jul 71, 77p APTD-0730

Descriptors: (*Bituminous coal, Economic surveys), Sulfur, Reserves, Coal mines, Statistical data, Commerce, Coke.
Identifiers: Applachian Region.

Operators of bituminous coal mines that produced 100,000 tons or more in 1967 in Alabama, eastern Kentucky, Maryland, Ohio, Pennsylvania, Tennessee, Virginia and West Virginia responded to a special questionnaire, or were personally contacted. A remaining reserve of 31.4 billion short tons of bituminous coal was reported as of December 31, 1967. At 1967 prices, 5.7 billion tons was reported as recoverable; an additional 7.7 billion tons could be recovered with a price increase up to and over $2.00 per ton. Of the reported recoverable reserve, 34 percent contains 1.0 percent or less sulfur. Reserves reported as captive accounted for 8 percent of the total remaining reserves; 40 percent was reported as commercially available on the open market. The remainder was reported as undifferentiated, neither captive nor commercial. Of the 266 million tons of coal reported produced in 1967, by the selected companies, about 43 percent was at a sulfur level of 1.0 percent or less. An additional 24 million tons, mostly high-quality coking coal, was exported. The balance of 44 million tons was used for other industrial purposes and retail sales. Coal analytical data are also provided. Differences in coal reserves estimates are discussed. (Author)

PB-202 401
Environmental Protection Agency, Kansas City, Mo.
FEDERAL ASSISTANCE PROJECT METROPOLITAN DENVER SEWAGE DISPOSAL DISTRICT, NO. 1, OCTOBER 1969--FEBRUARY 1970,
Bob A. Hegg, and John R. Burgeson. Mar 71, 50p

Descriptors: (*Sewage treatment, *Sludge disposal), Colorado.
Identifiers: *Denver (Colorado).

The Metropolitan Denver Sewage Disposal District no. 1 (Metro Denver) plant was designed mainly as a secondary treatment facility (activated sludge) to treat wastes from the cities and sanitary districts in the Metropolitan Denver Area. The most significant problem areas at the Metro Denver plant, leading to the request for assistance, were the sludge handling and sludge disposal problems. The major sludge handling problem was processing the volume and type of waste activated sludge generated by the secondary treatment process employed at the plant. Operational changes in the secondary treatment process, training in conducting various control tests and data evaluation were the major tasks performed during the assistance project. These functions were coupled with various operational recommendations for both short term and long term plant operation and control.

PB-202 403
Environmental Protection Agency, Kansas City, Mo.
THE CASE FOR BETTER WASTE TREATMENT,
John M. Rademacher, Carl V. Blomgren, and Carl M. Walter. Jan 71, 34p

Descriptors: (*Missouri River Basin, *Water pollution), Coliform bacteria, Sewage.
Identifiers: Reservoir releases, *Water quality data, Sewage treatment effluent.

The material presented is based on the detailed analysis of the data collected during investigations made of the Missouri River and its tributaries by the FWQA over the past two years and represents new approaches to pollution evaluation. The specific topics discussed include (1) bacterial investigation; (2) fecal sterol investigations; (3) pathogen isolations; (4) biological investigations including the periphyton and fish flesh tainting studies; and (5) goals to be achieved by secondary treatment.

PB-202 407
Tennessee Valley Authority, Muscle Shoals, Ala.
INVESTIGATION OF THE REACTIVITIES OF LIMESTONE TO REMOVE SULFUR DIOXIDE FROM FLUE GAS,
J. D. Hatfield, Y. K. Kim, R. C. Mullins, and G. H. McClellan. 30 Jun 70, 156p* APTD-0699

Descriptors: (*Limestone, *Adsorbents), (*Sulfur dioxide, *Adsorption), (*Air pollution, Sulfur dioxide), (*Sulfation, Limestone), Mineral deposits, Comparison, Chemical reactivity, Reaction kinetics, Disproportionation, Calcines, Flue gases, Combustion, Roasting, Calcium oxides, Magnesium oxides, Injection.
Identifiers: *Air pollution control.

An investigation has been conducted, concerning the properties of a limestone that are important in determining its effectiveness when injected into a combustion chamber to decrease the emission of SO2 in the stack gas from burning sulfur-containing fuel in a power plant. To obtain this information, reactivities of thirty-five stones were measured and correlated with their mineralogical and crystallographic properties. Rates and capacities of sulfation were taken as measures of reactivity. The report is divided into three parts: reaction mechanisms and kinetics, properties of calcines and sulfated limestones, and evaluation of the reactivities of selected limestones toward SO2.

PB-202 414
Eastern Environmental Radiation Lab., Montgomery, Ala.
RADIOLOGICAL SURVEY AROUND POWER PLANTS USING FOSSIL FUEL,
P. H. Bedrosian, D. G. Easterly, and S. L. Cummings. Jul 70, 27p EERL-71-3

Descriptors: (*Air pollution, *Radioactive contaminants), (*Electric power plants, Air pollution), (*Gas sampling, Radioactive contaminants), (*Public health, Radioactive contaminants), Steam electric power generation, Thermal power plants, Coal, Fly ash, Particles, Fossil fuels, Feasibility, Lung, Air filters.
Identifiers: Air pollution effects (Animals).

Release of radioactive materials in fly ash discharged from steam power plants burning fossil fuel, particularly coal, was investigated. Air sampling techniques were developed to provide useful data for use in estimating dose to critical organs, primarily lung, in man. Procedures are described for collecting air samples at environmental sites remote from the power plant facility. (Author)

PB-202 422
Pacific Northwest Water Lab., Corvallis, Oreg.
MATHEMATICAL MODEL OF THE COLUMBIA RIVER FROM THE PACIFIC OCEAN TO BONNEVILLE DAM. PART I. THEORY, PROGRAM NOTES AND PROGRAMS,
R. J. Callaway, K. V. Byram, and G. R. Ditsworth. Nov 69, 157p W71-11867, FWPCA-16070-DBH-11/69
See also Part 2, PB-202 423.

Descriptors: (*Rivers, Mathematical models), Estuaries, Tidewater, Water pollution, Temperature distribution, Periodic variations, Meteorological data, Tidal currents, Computerized simulation, Water flow, Flow measurement, Computer systems programs, Washington (State), Oregon.
Identifiers: *Tidal rivers, *Water pollution models, *Columbia river, Thermal pollution, Finite element analysis.

The Columbia River from the Pacific Ocean to Bonneville Dam is treated as a series of two-dimensional finite elements in the formulation of a mathematical model of the system. Currents and stages are simulated along the river via an explicit solution of the one-dimensional equations of motion and continuity; two-dimensional conditions in the horizontal are approached by means of a branched network of connecting channels and junctions. Computed net velocities and stages are used as input to the advection-diffusion equation and solutions are obtained for any coupled (e.g., BOD-DO) or uncoupled, first order reaction, conservative and/or non-conservative substance. Emphasis is placed on obtaining a solution for temperature as the dependent variable. Allowance is made for input of meteorological variables and a stepwise heat budget computation is made in order to predict temperature conditions on an hourly basis. A discussion of some existing pollution models, numerical methods and error sources is given; computer programs and program notes are listed. (Author)

PB-202 423
Pacific Northwest Water Lab., Corvallis, Oreg.
MATHEMATICAL MODEL OF THE COLUMBIA RIVER FROM THE PACIFIC OCEAN TO BONNEVILLE DAM. PART II: INPUT-OUTPUT AND INITIAL VERIFICATION PROCEDURES,
R. J. Callaway, and K. V. Byram. Dec 70, 126p W71-11868, FWPCA-16070-DBH-04/71
See also Part 1, PB-202 422.

Descriptors: (*Rivers, Mathematical models), Estuaries, Tidewater, Tidal currents, Water flow, Flow measurement, Water pollution, Temperature distribution, Periodic variations, Meteorological data, Computerized simulation, Input output routines, Washington (State), Oregon.
Identifiers: *Tidal rivers, *Water pollution models, *Columbia river, Thermal pollution, Finite element analysis.

The numerical model of the Columbia River system described in detail in Part 1 is illustrated in Part 2 by specific examples of input-output on test cases - these cases thus serve as a user's guide.

Preliminary verification of the model is discussed; conclusions and recommendations for future work are described. (Author)

PB-202 459
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
BACKGROUND INFORMATION FOR PROPOSED NEW-SOURCE PERFORMANCE STANDARDS: STEAM GENERATORS, INCINERATORS, PORTLAND CEMENT PLANTS, NITRIC ACID PLANTS, SULFURIC ACID PLANTS.

Aug 71, 61p* APTD-0711
Errata sheet inserted.

Descriptors: (*Industrial waste treatment, Standards), (*Air pollution, *Government policies), (*Standards, Air pollution), (*Chemical industry, Air pollution), (*Concrete plants, Air pollution), (*Boilers, Air pollution), (*Incinerators, Air pollution), Economic analysis, Regulations, Nitric acid, Sulfuric acid, Industrial plants, Particles, Combustion products, Nitrogen oxides, Sulfur dioxide.
Identifiers: *Air pollution control, Cement industry.

Background information is provided on the derivation of the proposed new-source performance standards and their economic impact on construction and operation. The purpose is for facilitating review and comment prior to promulgation of the standards. The performance standards were developed after consultation with plant owners and operators, appropriate advisory committees equipment designers, independent experts, and Federal departments and agencies. The promulgation of standards of performance for new stationary sources does not prevent state or local jurisdictions from adopting more stringent emission limitations for these same sources.

PB-202 570
American Oil Co., Mandan, N. Dak. Mandan Refinery.
FLUID BED INCINERATION OF PETROLEUM REFINERY WASTES.
Water pollution control research series.

Mar 71, 125p W71-11794, EPA-WQO-12050-EKT-03/71
Grant FWPCA-WPRD-215-01-68
Paper copy available from GPO $1.50 as stock no. 5501-0052.

Descriptors: (*Refineries, *Waste disposal), (*Incinerators, Oils), Fluidized bed processors, Process charting, Design, Performance evaluation.
Identifiers: *Oil wastes, *Solid waste disposal.

The applicability of the fluid bed incineration process for the disposal of petroleum refinery generated spent caustic and oily sludge in a commercial scale unit has been demonstrated. Operating problems have been studied. Design and operating procedural changes are suggested. The major process limitation stems from the loss of bed fluidity due to high particle size growth rate. Particle size growth rate is directly proportional to the particle diameter and rate of dissolved solid material charged and inversely proportional to the mass of material in the bed. The average particle diameter can be controlled by collecting and continuously returning fine material to the bed, utilizing an effective attriting system, and limiting superficial space velocity to avoid elutriation of fines. (Author Modified Abstract)

PB-202 571
Black, Sivalls and Bryson, Inc., Pittsburgh, Pa. Applied Technology Div.
EVALUATION OF A NEW ACID MINE DRAINAGE TREATMENT PROCESS.

Feb 71, 162p W71-11795, EPA-WQO-14010-DYI-02/71
Contract DI-14-12-529
Paper copy available from GPO $1.50 as stock no. 5501-0075.

Descriptors: (*Coal, *Combustion), (*Mine waters, *Water treatment), (*Desulfurization, Coal), Slags, Liquid metals, Electric power generation, Waste disposal, Utilization, Sulfur, Materials recovery.
Identifiers: *Mine wastes, *Water pollution control, *Mine acid drainage.

An economic and engineering evaluation of a submerged coal refuse combustion process to convert acid mine water (AMW) to potable water has been made. In this process coal refuse is burned in molten iron to supply energy for distillation or reverse osmosis, and the coal refuse sulfur is trapped in a slag for eventual recovery of sulfur. Laboratory experimentation was conducted on those areas which could profoundly affect the process. These areas were: A laboratory demonstration of slag desulfurization to produce sulfur, the evaluation of slag retention characteristics, slag capability for neutralizing AMW and determination of slag compositions having acceptable fluidities. Engineering studies show that the process has potential for supplying inexpensive energy for distillation and permits the recovery of sulfur so that distilled water is economically produced. (Author Modified Abstract)

PB-202 579
Syracuse Univ., N.Y. Dept. of Chemical Engineering and Metallurgy.
CARBON COLUMN OPERATION IN WASTE WATER TREATMENT,
Christopher Vanier, and Chi Tien. Nov 70, 87p* W71-12038, EPA-WQO-17020-DZO-11/70

Descriptors: (*Sewage treatment, *Absorbers (Equipment)), (*Sewage filtration, Activated carbon treatment), (*Activated carbon treatment, *Computerized simulation), Columns (Process engineering), Adsorption, Computer programs, Backwashing, Flow rate, Mathematical models.

The Adsorption and filtration of waste water in an isothermal column of granular activated carbon has been mathematically modeled. Based on this model, a simulation program was prepared and coded in Fortran IV to be run on the IBM 360/50 level G compiler. A separate companion study was conducted on the filtration of a clay suspension in an activated carbon bed to provide a filtration rate equation. The equation so obtained was then assumed to represent the filtration rate equation of the waste water. Adsorption, then was considered to be controlled by a combination of liquid phase diffusion and intraparticle diffusion. These two phenomena were then approximated by a solid phase rate expression based upon Glueckauf's linear driving force. In addition to adsorption and filtrations, the effects of backwashing and regeneration were also included in the model. A newly developed algorithm was used for the numerical integration of the pertinent characteristic normal hyperbolic equations. The design of the program allowed a clear separation of calculation framework and column model. This separation was made to permit new discoveries and new theories to be adapted to the basic program with minimal difficulty. The incompleteness and uncertainty of current theories of the carbon contact process will almost certainly make the ease of adaption the most important feature of the program.

PB-202 580
Washington Univ., Seattle. Dept. of Civil Engineering.
THE SOIL FILTER: A TREATMENT PROCESS FOR REMOVAL OF ODOROUS GASES.
Final rept.,
Dale A. Carlson, Robert Gumerman, and Curtis Leiser. Feb 70, 107p* W71-12039, EPA-WQO-17020-02/70
Grant FWPCA-WP-00883-03

Descriptors: (*Odor control, *Sewage treatment), (*Gas filters, *Soils), (*Hydrogen sulfide, *Adsorption), (*Thiols, Adsorption), Filtration, Moisture content, Materials recovery, Design criteria, Methane, Microorganisms, Loams, Clay soils, Sand filters, Fluid flow, Surface chemistry.
Identifiers: *Soil filters.

While the removal of odors emitted from various locations in sewage collection systems by pumping the gases through a soil filter has been well documented, the actual removal mechanisms remained to be established. The experiments performed involved variation of the average particle size and moisture content of the filters, and further experiments were also performed with sterile soil. It was determined that the soil filter was particularly effective in the removal of polar gases such as hydrogen sulfide and methyl mercaptan from waste streams. At hydrogen sulfide concentrations in excess of 100 mg/l the biological removal mechanisms were not significantly operative, and chemical removal mechanisms appeared to prevail. In dry sterile soil, adsorption coupled with surface catalysis reactions were found to be the predominant mechanisms for removal. For low gas concentrations (less than 100 mg/l H2S) the biological removal mechanisms were predominant and wet soil was preferred. Moist loam soil was able to remove 100% of a 775 mg/l mercaptan, in quantities of .85 liter per cu. ft. of soil/week. Methane was not removed in any case. With proper design and care, soil filters operated in a range favorable for the growth of microorganisms can be operated indefinitely.

PB-202 665
Thermo-Systems, Inc., St. Paul, Minn.
STATE OF THE ART: 1971. INSTRUMENTATION FOR MEASUREMENT OF PARTICULATE EMISSIONS FROM COMBUSTION SOURCES. VOLUME I: PARTICULATE MASS - SUMMARY REPORT,
Gilmore J. Sem, John A. Borgos, John G. Olin, John P. Pilney, and Benjamin Y. H. Liu. Apr 71, 194p* APTD-0733
Contract CPA-70-23
See also Volume 2, PB-202 666.

Descriptors: (*Monitors, *Particles), (*Air pollution, Particles), (*Bibliographies, *Detectors), Flue gases, Automatic control, Combustion products, Mass, Measuring instruments, Electrostatic analyzers, Beta particles, Piezoelectric gages, Attenuation, Gravimetric analysis, Sensors, Holography, Optical radar, Optical detection, Photometers, Light scattering, Samplers, Adsorbers (Equipment), Pressure gages, Acoustic detectors, Labeled substances, Hot wire anemometers.
Identifiers: *Air pollution detection, Soiling index.

All known sensing techniques available for application to automatic, continuous measurement of the rate of particulate mass emissions from large fossil-fuel combustion facilities are discussed. Emphasis is on the measurement of particle mass rather than other particle parameters, and emissions downstream rather than upstream of any control equipment. Although sensors for permanently-installed effluent monitoring systems are emphasized, much of the information is also applicable to portable and research instruments. Brief surveys are presented of all known particle sensing techniques. A brief discussion of the principle of operation is followed by a list of inherent and practical strengths and weaknesses of each technique. A list of commercial manufacturers of related equipment and a list of 1,352 references helps the reader who needs more information on a specific technique. Recommendations for further development outline areas of needed improvement for techniques which offer some promise for stack monitoring. The introduction includes general comments which apply to all sensing techniques, and ranks all techniques in order of present apparent potential. A separate chapter summarizes typical conditions found in large fossil-fuel effluent gases and sets the necessary specifications

for a particulate monitoring instrument which operates in an effluent gas atmosphere.

PB-202 666
Thermo-Systems, Inc., St. Paul, Minn.
STATE OF THE ART: 1971. INSTRUMENTATION FOR MEASUREMENT OF PARTICULATE EMISSIONS FROM COMBUSTION SOURCES. VOLUME II: PARTICULATE MASS - DETAIL REPORT,
Gilmore J. Sem, John A. Borgos, John G. Olin, John P. Pilney, and Benjamin Y. H. Liu. Apr 71, 225p* APTD-0734
Contract CPA-70-23
See also Volume 1, PB-202 665.

Descriptors: (*Monitors, *Particles), (*Air pollution, Particles), Measuring instruments, Automatic control, Sensors, Samplers, Combustion products, Flue gases, Mass, Coal, Oil, Sampling, Attenuation, Beta particles, Acoustic detectors, Piezoelectric gages, Gravimetric analysis, Electrostatic analyzers, Optical detection, Holography, Light transmission, Light scattering, Optical radar, Hot wire anemometers, Pressure gages.
Identifiers: *Air pollution detection, Soiling index.

All known sensing techniques available for application to automatic, continuous measurement of the rate of particulate mass emissions from large fossil-fuel combustion facilities are discussed. The measurement of particle mass rather than other particle parameters is emphasized. Although the report emphasizes permanently-installed effluent monitoring systems, much of the information is also applicable to portable and research instruments. Detailed discussions of particle sensing techniques as applied to emissions monitoring are presented. Each discussion analyzes possible problems and their solutions, in using the technique for emission monitoring, and includes an analysis of what particulate parameter the technique sees, how closely the measurement correlates with particulate mass, inherent measurement errors, practical design problems and possible solutions, the potential sensitivity and response of each technique, the complexity of the potential instrument, the present state of development of the technique, and recommendations for further development. Each discussion includes a complete bibliography. A separate chapter describes typical conditions found in large fossil-fuel effluent gases in detail. Another separate chapter summarizes many of the problems encountered in the design of sampling probes required by most of the particle sensing techniques.

PB-202 677
Bureau of Radiological Health, Rockville, Md. Office of the Director.
PUBLICATIONS INDEX.

Jul 71, 272p BRH-OBD-72-1
Supersedes report dated Jul 70, PB-195 971.

Descriptors: (*Radiobiology, Indexes (Documentation)), Bibliographies.

The BRH Publications Index was prepared to aid in the identification and retrieval of publications originated (author or contractor) or published by the Bureau of Radiological Health. These publications include journal articles, Government publications and technical reports, audiovisual materials, and selected staff papers. For convenience, the BRH Publications Index is divided into three sections: KWIC index, Author index, and Bibliography index.

PB-202 698
Harvard Univ., Cambridge, Mass. Harvard Water Program.
THE ECONOMICS OF WATER SUPPLY AND QUALITY,
Robert Dorfman, Harold Thomas, Jr., and Henry D. Jacoby. Feb 71, 44p W71-12333, EPA-WQO-16110-DTF-12/71
Paper copy available from GPO $0.50 as stock no. 5501-0070.

Descriptors: (*Water supply, Economic analysis), (*Water quality, Economic analysis), Rivers, Stream flow, Mathematical models, Water resources, Wastes, Regional planning, Simulation, Droughts, Estuaries, Cost estimates, Flow measurement.

Research has been directed to a series of problems in water resource management. One pair of projects has focused on problems of water supply planning under uncertainty, and improved methods of analysis for planning have been developed. A set of four research efforts has been devoted to problems of water quality management, with special attention given to the decisions faced by municipalities and regional authorities. New conceptual models of quality management institutions have been proposed, and the conceptual framework has been applied to several sample river basins. A third focus has been on the development of improved computing methods for analysis of river basins. Two projects have contributed new analytical models for preliminary screening of river basin designs. Special attention has been directed to the analysis of flow augmentation for water quality management. Finally, research has been carried out on the use of regional analysis in water resource planning. A static regional input-output model has also been developed that can analyze the interrelations between regional growth and efforts at water quality control. (Author)

PB-202 732
Santa Clara Univ., Calif. School of Engineering.
STUDY OF DECOMPOSED METHANOL AS A LOW EMISSION FUEL.
Final rept.,
R. K. Pefley, M. A. Saad, M. A. Sweeney, J. D. Kilgroe, and R. E. Fitch. 30 Apr 71, 106p*

Descriptors: (*Air pollution, *Exhaust gases), (*Automotive fuels, *Methyl alcohol), (*Spark ignition engines, Air pollution), (*Catalysis, Methyl alcohols), Design criteria, Combustion, Decomposition reactions, Gas chromatography, Aldehydes, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Automobile engines.
Identifiers: *Automobile exhaust, *Air pollution control.

Tests were run on a CFR engine to study the feasibility of using dissociated methanol as an automotive fuel. Using simulated decomposed methanol, in the range of 0 to 100%, exhaust emissions were analyzed by gas chromatography and IR sensors, and their trends were determined as functions of compression ratio, air-fuel ratio, spark advance, intake manifold temperature and degree of dissociation of the fuel. The exhaust emission results were also related to engine performance in terms of indicated horsepower and indicated thermal efficiency. A summary of the experimental program and considerations of methods of using exhaust energy for decomposing methanol are presented. (Author)

PB-202 810
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
STATE AND FEDERAL CONTROL OF HEALTH HAZARDS FROM RADIOACTIVE MATERIALS OTHER THAN MATERIALS REGULATED UNDER THE ATOMIC ENERGY ACT OF 1954 (AS OF OCTOBER 1, 1969),
George L. Pettigrew, Earl W. Robinson, and Gail D. Schmidt. Jun 71, 106p BRH/DMRE-71-4 FDA-72-8001
Paper copy available from GPO $1.00 as stock no. 1715-0021.

Descriptors: (*Radioactive materials, Regulations), (*Radiation hazards, Control), Federal government, State government, Regulations, Medicine, Industries, Health physics, Radioactive wastes, Radiation injuries.

The report covers the magnitude and extent of the use of radium and accelerator-produced materials in the United States, their relative hazards, and the extent to which they are presently controlled. Summarized are inadequacies in both State and Federal programs for controlling these radioactive materials. (Author)

PB-202 814
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
NUCLEAR MEDICAL TECHNOLOGY TRAINING,
Guy H. Simmons. Jun 71, 78p BRH/DMRE-71-5 FDA-72-8002
Paper copy available from GPO $0.75 as stock no. 1715-0022. Proceedings of a Colloquium held February 28, 1969, at the Radioisotope Laboratory, Cincinnati General Hospital, Cincinnati, Ohio.

Descriptors: (*Education, *Radiobiology), Health physics, Radiation hazards, Meetings, Radiation protection, Radiation effects, Radiation decontamination, Radiation injuries, Programs.
Identifiers: Nuclear medicine.

The publication contains the proceedings of a colloquium held in Cincinnati, Ohio on February 28, 1969. Sponsors were the Bureau of Radiological Health and the University of Cincinnati Radioisotope Laboratory. A report was presented on progress of the Bureau-supported Nuclear Medical Technology Training Project at the University. Participants reported briefly on other training programs in the field. (Author)

PB-202 865
Cincinnati Univ., Ohio. Dept. of Civil Engineering.
URBAN RUNOFF CHARACTERISTICS.
Water pollution control research series,
Herbert C. Preul, and Constantine Papadakis. Oct 70, 362p W71-12703, EPA-WQO-11024-DQU-10/70
Paper copy available from GPO $2.75 as stock no. 5501-0098.

Descriptors: (*Surface water runoff, *Urban areas), Water quality, Storms, Watersheds, Management planning, Mathematical models, Water pollution, Storm sewers, Volume, Surveys, Ohio.
Identifiers: Cincinnati (Ohio).

Detailed information on the watershed characteristics and data on runoff quantity and quality have been compiled from a one year study of a combined sewer watershed of approximately 2380 acres in Cincinnati, Ohio. Collection of these data is planned to continue over a several year period. The information collected will be used to test and develop practical storm water management models. (Author)

PB-202 867
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
RESULTS OF THE 1970 MICROWAVE OVEN SURVEY,
LaVert C. Seabron, and Lewis W. Coopersmith. Aug 71, 158p BRH/DEP-72-2 FDA-72-8007
Paper copy available from GPO $1.25 as stock no. 1715-0023.

Descriptors: (*Cooking devices, *Radiation hazards), Microwave equipment, Safety engineering, Investigations, Surveys.
Identifiers: *Microwave ovens.

A survey of microwave ovens was conducted to identify those makes and models which leak excessively a nd to have the manufacturers of those

ovens exhibiting excessive leakage initiate appropriate corrective action. Over 4000 ovens, consisting of approximately 42 models produced by foreign and domestic manufacturers, were surveyed. As a result of the survey, seven manufacturers have agreed to implement corrective action programs to reduce the microwave radiation leakage from an estimated 10,000 ovens of the more than 100,000 ovens now in use. (Author)

PB-202 878
Pacific Northwest Water Lab., Corvallis, Oreg.
ENVIRONMENTAL FACTORS IN COASTAL AND ESTAURINE WATERS. BIBLIOGRAPHIC SERIES - VOLUME I. COAST OF OREGON.
Water pollution control research series,
George R. Ditsworth. Oct 66, 70p Working Paper-20-2 W71-12704, EPA-WQO-16070-10/66
See also Volume 2, PB-202 879.

Descriptors: (*Oregon, Coasts), (*Coasts, Environment), Oceanographic data, Fisheries, Water pollution, Marine biology, Climatology, Marine geology, Hydrology, Bibliographies, Chemical properties, Sea water, Estuaries.

The annotated bibliography comprises 394 references to published and unpublished literature pertaining to research and engineering on the natural phenomena of Oregon's coastal and estuarine waters and their adjacent land masses. References are alphabetically listed by principal author or corporate author (organization) under one or more of seven general subject headings: Marine Biology (75 ref); Climate (4 ref); Fisheries, (35 ref); Geology, (57 ref); Hydrology, (30 ref); Chemical and Physical Oceanography, (164 ref); Bibliographies, Literature Surveys and Compilations, (29 ref). References were selected by systematically searching about 15 major publication or information sources. (See also W71-12705).

PB-202 879
Pacific Northwest Water Lab., Corvallis, Oreg.
ENVIRONMENTAL FACTORS IN COASTAL AND ESTUARINE WATERS. BIBLIOGRAPHIC SERIES - VOLUME II. COAST OF WASHINGTON,
George R. Ditsworth. Aug 68, 88p W71-12705, EPA-WQO-16070-08/68
See also Volume 1, PB-202 878.

Descriptors: (*Coasts, Environment), (*Washington (State), Coasts), Coastal engineering, Marine biology, Fisheries, Marine geology, Water pollution, Oceanographic data, Chemical properties, Bibliographies, Estuaries.

The annotated bibliography comprises 346 references to published and unpublished literature pertaining to research and engineering on the natural phenomena of Washington's coastal and estuarine waters and their adjacent land masses. References are alphabetically listed by principal author or corporate author (organization) under one or more of seven general subject headings: Marine Biology (124 ref); Fisheries (56 ref); Geology (101 ref); Chemical and Physical Oceanography (5 ref); Water Pollution (45 ref); and Bibliographies, Literature Surveys and Compilations (15 ref). References were selected by systematically searching about 25 major publication or information sources. (Author)

PB-202 925
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
EVALUATION OF THE TOSHIBA CAPACITOR DISCHARGE MOBILE X-RAY MACHINE,
G. F. Grove, Jr. May 71, 30p BRH/DEP-72-1 FDA-72-8006
Paper copy available from GPO $0.35 as stock no. 1715-0024.

Descriptors: (*X-ray apparatus, Evaluation), (*Radiation hazards, X-ray apparatus), Safety engineering, Mobile equipment, Spurious radiation.
Identifiers: *Capacitor discharge X-ray machines.

Tests were performed on a Toshiba KCD-10M-6 capacitor discharge mobile x-ray machine to determine accuracy of voltage indications, the relationship between voltage setting and current-time values, line voltage effects and current drain, exposure reproducibility, focal spot size and location, correspondence between the collimator and light localizer, inherent filtration, half-value layer, radiation output, and tube housing and collimator leakage. Spurious radiation was found to originate in the tube under certain conditions. These conditions were investigated, and the observed radiation levels are reported. (Author)

PB-202 961
General Motors Corp., Indianapolis, Ind. Detroit Diesel Allison Div.
COLLECTION AND ASSESSMENT OF AIRCRAFT EMISSIONS BASE-LINE DATA TURBOPROP ENGINES (ALLISON T56-A-15.
Final technical rept. 1 Jun-16 Aug 71,
J. M. Vaught, W. M. Parks, S. E. J. Johnson, and R. L. Johnson. Sep 71, 70p DDAD-EDR-7200
Contract EPA-CPA-68-04-0029

Descriptors: (*Air pollution, Exhaust gases), (*Turboprop engines, *Exhaust gases), (*Aircraft engines, Exhaust gases), Aircraft landing, Takeoff, Performance evaluation, Carbon monoxide, Carbon dioxide, Nitrogen oxides, Hydrocarbons, Aldehydes, Smoke, Particles, Sampling, Chemical composition.
Identifiers: *Jet engine exhaust, T-56 engines, T-56-A-15 engines.

Exhaust emissions data were collected and evaluated from eleven new T56-A-15 military turboprop engines during their production-line performance evaluation. The normal production test schedule was used. Experimental data were analyzed by converting the concentration values measured for each engine to mass emissions over a landing and takeoff (LTO) cycle representative of a commercial flight with T56-type engines and then performing a statistical analysis to obtain mean and standard deviation values. (Author)

PB-202 973
Texas Water Development Board, Austin.
QUAL - 1 SIMULATION OF WATER QUALITY IN STREAMS AND CANALS. PROGRAM DOCUMENTATION AND USERS MANUAL.
Final rept.

Sep 70, 102p EPA-OWP-TEX-QUAL-1
See also PB-202 975, and PB-202 974.

Descriptors: (*Computer programming, *Manuals), (*Water quality, Mathematical models), (*Water resources, *Texas), Rivers, Computerized simulation, Input output routines, Temperature, Biochemical oxygen demand, Dissolved gases, Minerals, Diffusion theory, FORTRAN.
Identifiers: QUAL-1 computer program, FORTRAN 4 programming language.

The report documents a mathematical model developed for use in simulating water quality behavior of streams and canals. The spatial and temporal variations of temperature, biochemical oxygen demand, dissolved oxygen, and conservative minerals can be predicted on an hourly basis utilizing the one dimensional form of the advection-diffusion transport equation. The report provides instructions on program usage, input-output descriptions, program description and listing, variable name definitions and flow charts of program logic. (Author)

PB-202 974
Texas Water Development Board, Austin.
DOSAG - 1 SIMULATION OF WATER QUALITY IN STREAMS AND CANALS. PROGRAM DOCUMENTATION AND USERS MANUAL.
Final rept.

Sep 70, 58p EPA-OWP-TEX-DOSAG-1
See also PB-202 973.

Descriptors: (*Computer programming, *Manuals), (*Water quality, Mathematical models), (*Water resources, *Texas), Rivers, Computerized simulation, Dissolved gases, Oxygen, Steady flow, Stream flow, Waste water, Temperature, Biochemical oxygen demand.
Identifiers: DOSAG-1 computer program, San Antonio River.

The report documents a mathematical model developed to predict the steady state dissolved oxygen concentrations in streams and canals resulting from a specified set of streamflow, wasteload, and temperature conditions. The model will determine the streamflow required to maintain a specified dissolved oxygen goal and will search the system for available storage to achieve the goal. The model can be used to estimate mean monthly dissolved oxygen levels over a full year. Both carbonaceous and nitrogenous oxygen demands are included and up to five degrees of treatment for both can be specified. (Author)

PB-202 975
Texas Water Development Board, Austin.
SIMULATION OF WATER QUALITY IN STREAMS AND CANALS. THEORY AND DESCRIPTION OF THE QUAL-1 MATHEMATICAL MODELING SYSTEM.
Final rept.

May 71, 62p Rept. no. 118 EPA-OWP-TEX-128
See also PB-202 973.

Descriptors: (*Water quality, Mathematical prediction), (*Rivers, Mathematical models), (*Water resources, *Texas), Computerized simulation, Input output routines, Heat transfer, Air water interactions, Biochemical oxygen demand, Dissolved gases, Waste water, Minerals, Diffusion theory, Tables (Data), FORTRAN.
Identifiers: QUAL-1 computer program, FORTRAN 4 programming language.

The report presents the theory and description of the QUAL-I Mathematical Modeling System which is a set of interrelated quality routing models for predicting the temporal and spatial distribution of temperature, biochemical oxygen demand and dissolved oxygen, and conservative minerals within a segment of a river basin. The governing differential equation is solved by an implicit-finite-difference technique under the assumption that advection along the longitudinal axis of the stream is the primary mode of transport. Model application results are presented. (Author)

PB-203 000
Bureau of Radiological Health, Rockville, Md. Div. of Medical Radiation Exposure.
NATIONAL CONFERENCE ON COLLEGE AFFILIATED EDUCATIONAL PROGRAMS IN RADIOLOGIC TECHNOLOGY HELD AT: CENTER OF ADULT EDUCATION, UNIVERSITY OF MARYLAND, COLLEGE PARK. DECEMBER 8-11, 1970.

Jun 71, 293p BRH/DMRE-72-2 FDA-72-8011
Paper copy available from GPO $2.25 as HE20.4112:72-2.

Descriptors: (*Radiology, Education), Meetings, Schools, Projects, Manpower.
Identifiers: College affiliated programs.

The publication contains the proceedings of a conference which served to identify the problems encountered by radiologic technology programs in two-year colleges and to develop a compendium of

information needed to promote and support such programs. Included are formal presentations, final reports and recommendations of the four workshop groups (curriculum, administration, manpower and external influences), and information obtained in a survey of twelve selected schools of radiologic technology. (Author)

PB-203 060
Environmental Protection Agency. Research Triangle Park, N. C. Air Pollution Control Office.
CONSTRUCTION DETAILS OF ISOKINETIC SOURCE-SAMPLING EQUIPMENT,
Robert M. Martin. Apr 71, 35p* APTD-0581

Descriptors: (*Samplers, Fabrication), (*Gas sampling, Samplers), Design, Engineering drawings, Calibrating, Glassware, Solenoid valves.
Identifiers: *Air pollution detection.

The report was prepared in order that interested persons in local air pollution agencies might build their own isokinetic source-sampling equipment. This equipment was designed and has been used since 1967 by employees of the U.S. Environmental Protection Agency's Air Pollution Control Office (APCO). In a field test, the equipment was run for two 24-hour periods without encountering any malfunctions. The construction details include: The meter box; Umbilical cord; Sample box with glassware; Probe; and Calibration procedures for the orifice and meter.

PB-203 061
MSA Research Corp., Evans City, Pa.
INORGANIC LIQUIDS FOR REMOVING SO2 FROM FLUE GASES. PHASE II.

Jul 71, 129p* MSAR-71-122 APTD-0723
Contract PH-22-68-11

Descriptors: (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, *Adsorption), (*Calcium oxides, *Adsorbents), (*Tin alloys, Adsorbents), Fused salts, Nitrates, Corrosion, Chemical reactions, Eutectics, Regeneration (Engineering), Lead containing alloys, Scrubbers.
Identifiers: *Air pollution control, *Waste gas recovery.

A laboratory investigation has been made on those candidate systems for SO2 removal that were developed during a literature search. Emphasis in the investigation was placed on the definition of those parameters which would allow a more definitive engineering evaluation. Of the four candidate systems recommended previously, the nonregenerable limestone-molten nitrate system, and the adduct or complex-forming molten nitrate system have been rejected. The remaining candidate systems - the molten nitrate-calcium oxide system and the tin-lead alloy system-have been investigated in some detail. Comparison studies of the various reactive oxides dissolved or suspended in the molten nitrate solvents have shown that the best reactant is calcium oxide. The complete results of this experimental program are presented in the report.

PB-203 063
TRW Systems Group, McLean, Va. Washington Operations.
CONTROLLING AIR QUALITY; ST. LOUIS CASE STUDY,
S. E. Plotkin, and D. H. Lewis. Jun 71, 144p 11130-W002-R0-00 APTD-0709
Contract PH-22-68-60

Descriptors: (*Air pollution, *Regional planning), Strategy, Data processing, Standards, Cost estimates, Economic analysis, Atmospheric motion, Atmospheric diffusion, Land use, Benefit cost analysis, Missouri.
Identifiers: Air pollution control, *Air Quality Implementation Planning Program, Saint Louis (Missouri).

The report addresses two major questions in air pollution control: What emission control strategy should be used by the states to achieve their air quality goals. How can air quality effects of changing land use patterns to predicted. A comparison of three alternate emission control strategies as applied to the St. Louis Air Quality Control Region, is presented. The strategies are: A conventional set of emission source-category standards. A rollback strategy, and A least-cost strategy. Study results include regional costs, air quality achieved, emission reductions, plots of pollutant concentration levels (isopleths), and a measure of benefit. The report also presents a description and brief analysis of a simple procedure by which a diffusion model can be used to predict the (air Quality) consequences of shifting land use, without incurring the expense of continually re-running the entire model.

PB-203 067
TRW Systems Group, McLean, Va. Washington Operation.
SENSITIVITY ANALYSIS OF SELECTED AIR QUALITY IMPLEMENTATION PLANNING PROGRAM INPUT PARAMETERS,
W. D. Dickerson. Jul 71, 94p 11130-W003-R0-00 APTD-0726
Contract PH-22-68-60

Descriptors: (*Air pollution, *Regional planning), Strategy, Data processing, Cost estimates, Computer programming, Economic analysis, Sensitivity, Atmospheric motion, Atmospheric diffusion, Air pollution control equipment.
Identifiers: *Air Quality Implementation Planning Program, Air pollution control.

A major problem in the analysis of regional air pollution abatement (control) strategies is the collection and verification of an adequate data base. If computer programs (such as the Air Quality Implementation Planning Program (IPP)) are used, the scope of the data base must be expanded to include: Effective stack parameters and Regional cost data as an aid in the definition and use of these parameters, their sensitivity, with respect to pollutant concentration values and/or annual device cost are determined. The study utilizes the atmospheric diffusion model and the control cost model of the IPP. Since these models use generally accepted techniques, and have been verified through extensive use, the study conclusions and recommendations are generally applicable. Sensitivity analysis of the effective stack height parameters for individual sources is presented. Sensitivity analysis of the regional cost parameters with respect to the annual control cost of each physical device available in the IPP control cost model is also given.

PB-203 069
Envirogenics Co., El Monte, Calif.
INVESTIGATION OF A NEW PHOSPHATE REMOVAL PROCESS,
L. M. Soffer, J. R. Lowell, Jr., and B. I. Loran. Nov 70, 80p W71-13309, EPA-WQO-17010-DJA-11/70
Contract DI-14-12-487
Paper copy available from GPO $0.75 as EP2.10:17010DJA-11/70.

Descriptors: (*Phosphates, *Chemical removal (Sewage treatment)), (*Ion exchanging, Phosphates), (*Sewage treatment, Phosphates), (*Ion exchange resins, Synthesis (Chemistry)), Economic analysis, Cost estimates, Regeneration (Engineering), Calcium oxides, Precipitation (Chemistry), Sulfonyl halides, Iron inorganic compounds.
Identifiers: Water pollution control, Tertiary sewage treatment.

Two new types of resins were subjected to laboratory evaluations of their technical and economic feasibility for use in phosphate removal. Multivalent metal derivatives of sulfonic acid resins were found to have good phosphorus capacities. The Iron (III) form of Amberlite 200 strong acid cation exchange resin, for example, exhibited capacities of up to 9.5 mg P/ml of wet resin, and in tests with secondary effluent, a 2.7 mg P/ml capacity was obtained. Exhausted resin was easily regenerable with dilute ferric chloride solution, and after ten exhaustion-regeneration cycles were performed on one sample, no detectable loss of phosphorus capacity was observed. The iron and phosphorus removed from the wastewater and concentrated in the waste brine were subsequently removed from the waste brine by lime addition and settling. A thorough cost analysis including both fixed construction costs as well as operation and maintenance costs, established the price of wastewater treatment by this method as 34.38 cents/gal. (Author)

PB-203 070
Southwest Missouri State College, Springfield.
DNA CONCENTRATION AS AN ESTIMATE OF SLUDGE BIOMASS.
Water pollution control series,
Roar L. Irgens. Feb 71, 30p W71-13310 EPA-WQO-17070-DHO-01/71
Paper copy available from GPO $0.40 as stock no. 5501-0112.

Descriptors: (*Sludge, Chemical indicators), (*Activated sludge process, *Biomass), (*Deoxyribonucleic acids, *Chemical indicators), Sewage treatment, Measurement, Colorimetric analysis, Spectroscopic analysis, Ultrasonic radiation, Degradation, Cells (Biology).
Identifiers: Lysis.

Experiments were conducted on various activated sludge samples over a span of several months to determine the feasibility of using cell DNA as an estimate of sludge biomass. These investigations demonstrated that free DNA released into a solution of viable microorganisms by lysis of cells was rapidly degraded. Therefore, DNA obtained from such cultures would effectively be DNA from viable organisms. Crude DNA was extracted from activated sludge by rupturing the cells by Sonication and centrifuging the sonicated sludge, heating at 70C to pasteurize the supernatant, and centrifuging again. Estimation of cell population was made by assuming the weight of one cell to be 1 x 10 to the -9th mg, and the DNA content of organic matter to be about 4% of the total weight of the organic matter. Population sizes based on DNA analyses were checked by using the MPN method. Values obtained were similar to values obtained with other methods.

PB-203 072
Research Triangle Inst., Durham, N.C. Statistics Research Div.
MOTOR VEHICLE ASSEMBLY LINE TESTING.
Final rept.

Aug 70, 91p* APTD-0718
Contract CPA-70-147

Descriptors: (*Air pollution, *Exhaust gases), (*Automotive industry, *Quality assurance), Assembly lines, Motor vehicles, Tests, Carbon monoxide, Hydrocarbons, Monitors, Standards, Government policies, Cost estimates, Automobile engines, Acceptability, Statistical quality control.
Identifiers: *Automobile exhaust.

The problem addressed in the report concerns the control of emissions from motor vehicles and particularly the actions which may be taken before these motor vehicles are released by the manufacturers to the public. NAPCA exerts its main point of control at the prototype stage, by issuing certificates for engine prototypes which pass certain criteria when subjected to a standard test procedure. The major requirements are on the level of carbon monoxide (CO) and hydrocarbons (HC) in the exhaust. The Secretary of Health, Education and Welfare has been authorized to test new vehicles or engines being manufactured to

determine if they are in fact constructed in all material respects substantially the same as the certified vehicle or engine. The study has been conducted to assemble meaningful information concerning motor vehicle assembly line testing for assisting policymakers in planning courses of action. Assembly line testing is herein projected as a program in quality control and assurance having two essential parts: the control and assurance program carried out by the manufactureres and the audit and monitoring function carried out by NAPCA. The planning, the development, and the implementation of both parts of the projected program are presented.

PB-203 084
CONSAD Research Corp., Pittsburgh, Pa.
AN ECONOMIC MODEL SYSTEM FOR THE ASSESSMENT OF EFFECTS OF AIR POLLUTION ABATEMENT. VOLUME I. THE OAP ECONOMIC MODEL SYSTEM DEVELOPMENT AND DEMONSTRATION.
Final rept.

15 May 71, 301p* APTD-0751
Contract EPA-APCO-68-04-0039

Descriptors: (*Air pollution, *Economic models), Abatement, Cost estimates, Benefit cost analysis, Economic analysis, Taxes, Industries, Strategy, Unemployment.
Identifiers: *Air pollution control, *Cost sharing, *Regional Air Pollution Systems Analysis, Air Quality Control Regions.

The report presents a summary of the development, demonstration, and assessment of an economic model as an operational, analytical tool for abatement policy assessment. This economic model which was initiated as part of the Regional Air Pollution Analysis Program focused on the regional economies of the various Air Quality Control Regions. Thus it will be useful for assessment of control strategies at the regional level, where most of the implementation plans are prepared. There has been an increased focus in the model system toward the assessment of interregional and national economic effects. However, this system is still a regional economic system with limited capabilities to measure the interregional and national effects.

PB-203 111
Institute of Public Administration, Washington, D.C.
GOVERNMENTAL APPROACHES TO AIR POLLUTION CONTROL. A COMPENDIUM AND ANNOTATED BIBLIOGRAPHY,
Robert Witherspoon, John Hoicka, Terry Trumbull, and Don Infeld. 15 Jul 71, 560p* APTD-0749
Contract EHS-70-126

Descriptors: (*Air pollution, Government policies), (*Government policies, *Project planning), Legislation, Standards, National government, Bibliographies, Law enforcement, Sources, Strategy, Litigation, Taxes, Depreciation, Land use, Cost estimates, Economic analysis, Industries, Abatement.
Identifiers: *Air pollution control, Tax incentives, Clean Air Act 1971, Air pollution standards, *Cost sharing.

A study is presented consisting of a compilation of information to be used for evaluation of present programs and development of new approaches to air pollution control. The study begins with the description and analysis of federal legislation with particular reference to the Clean Air Act. Federal experience with voluntary compliance is reviewed. The experience with emission standards is reviewed and analyzed. A review is presented of variour land use controls to improve the dispersion of pollution from stationary sources and to reduce exposure to pollutants. The role that private legal action may play in the control of pollution is reviewed. Information is presented on the concept of cost sharing and such measures as accelerated depreciation, investment tax-credits and tax exemptions. The use of economic incentives making it profitable for a firm to introduce measures for pollution control and, the possibilities of requiring polluters to pay a charge for which they are responsible are reviewed. The system for the control of air pollution in use in South Wales is described and analyzed. Finally, an assessment of the above approaches based upon the evaluation criteria which were developed in the course of the project is discussed.

PB-203 127
TRW Systems Group, McLean, Va. Washington Operations.
SOME APPLICATIONS OF THE IMPLEMENTATION PLANNING PROGRAM,
D. H. Lewis, S. E. Plotkin, and K. R. Woodcock. Apr 71, 230p* APTD-0710
Contract PH-22-68-60

Descriptors: (*Air pollution, *Regional planning), (*Air pollution control equipment, Cost estimates), Cost effectiveness, Project planning, Abatement, Models, Standards, Land use, Inventories, Particles, Sulfur dioxide, Mathematical m, Atmospheric motion, Economic analysis, District of Columbia, Missouri, Ohio.
Identifiers: *Implementation Air Pollution Planning Program, *Air pollution control, Cincinnati (Ohio), Saint Louis (Missouri), Air pollution standards.

The report describes a study of certain applications of the Implementation Planning Program (IPP), undertaken as a part of Phase III of the Regional Air Pollution Analysis Project. The Implementation Planning Program is an air resource management planning tool which includes mathematical models representing the atmospheric diffusion of pollutants, the cost and effectiveness of pollution control measures, and the potential air quality impact of air pollution control strategies upon which control legislation may be based. The following objectives are examined here: Estimation of the demand for control measures generated by the need to meet the requirements of the Clean Air Act, as amended; Examination of the emission standards which were used in the Cost of Clean Air Report of the Clean Air Act, and to determine if the assumption that these emission standards will achieve air quality standards is valid; Observation of the operational data requirements of an IPP type analysis, to determine whether or not these requirements may be relaxed and the corresponding data collection problems reduced. (Author)

PB-203 128
Midwest Research Inst., Kansas City, Mo.
PARTICULATE POLLUTANT SYSTEM STUDY. VOLUME I - MASS EMISSIONS,
A. E. Vandegrift, L. J. Shannon, P. G. Gorman, E. W. Lawless, and E. E. Sallee. 1 May 71, 376p* APTD-0743-Vol-I
Contract CPA-22-69-104

Descriptors: (*Air pollution, *Particles), (*Industrial waste treatment, Particles), (*Reviews, Air pollution), Dust control, Sources, Data aquisition, Industrial wastes, Open pit mining, Iron and steel industry, Petroleum refining, Fuels, Fertilizers, Bituminous concretes, Foundries, Coal mining, Chemical industry, Ranking, Information retrieval, Boilers, Odors, Electric power plants, Lumbering.
Identifiers: *Air pollution control, Cement industry.

A program on particulate air pollution from stationary sources in the continental United States was conducted. The specific objective of the study was to identify, characterize, and, to the extent possible, quantify the particulate air pollution problem. Information was to be assembled and analyzed on the kind and magnitude of specific sources, and the status of current control practices. The resultant information was to be used to identify deficiencies in current knowledge regarding the nature of important particulate pollution sources, and to provide requisite handbook data for the design and application of control devices. The results of the study are presented. (Author)

PB-203 129
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
FIELD INVESTIGATION OF SULFUR DIOXIDE WASHOUT FROM THE PLUME OF A LARGE COAL-FIRED POWER PLANT BY NATURAL PRECIPITATION.
Final rept.,
J. M. Hales, J. M. Thorp, and M. A. Wolf. Mar 71, 217p APTD-0739
Contract CPA-22-69-150

Descriptors: (*Air pollution, *Sulfur dioxide), (*Precipitation (Meteorology), Air pollution), Rainfall, Snowfall, Solubility, pH, Electric power plants, Cleaning, Monitors, Sulfates, Plumes, Flue gases, Atmospheric condensation.
Identifiers: *Precipitation washout, LAPPES (Large Power Plant Effluent Study).

An experimental investigation was conducted to measure the sulfur dioxide washout by natural precipitation from the plume of a large, coal-fired plant. The field investigation extended over three one-month periods in the vicinity of the Keystone Generation Station where 11 to 23 tons of sulfur dioxide, depending on power output, were released hourly from two 800 feet stacks. The primary objective of the study was to assess the effectiveness of precipitation washout as a mechanism for removing sulfur compounds from the plume of the keystone plant. A secondary objective of the study was to evaluate the relative importance of various interractions and atmospheric variables.

PB-203 189
Bituminous Coal Research, Inc., Monroeville, Pa.
STUDIES ON DENSIFICATION OF COAL MINE DRAINAGE SLUDGE.
Water pollution control research series,
R. C. Streeter, R. A. Glenn, and R. K. Young. Sep 71, 131p W71-13515, EPA-WQO-14010-EJT-09/71
Paper copy available from GPO $1.25 as stock no. 5501-0101.

Descriptors: (*Mine waters, *Neutralization), (*Coal mines, Mine waters), (*Sludge disposal, Mine waters), (*Dewatering, *Sludge), (*Water pollution, Mine waters), Calcium oxides, Waste disposal, Materials handling, Magnetic separators, Carbonation, Dewatering, Filtration, Precipitation (Chemistry), Coagulation, Aluminum, Contaminants, Magnesium, Concentrating.
Identifiers: Magnetic precipitation, *Mine acid drainage, *Water pollution control.

Bench scale batch experiments were performed on sludges obtained from line neutralization of coal mine drainage in an attempt to alleviate present problems in sludge handling and disposal. Tests were of an exploratory nature and did not afford sufficient data for cost analyses. Ferro Magnetic sludge densification, filter aids, coagulant aids, heating, freeze drying, and coprecipitation of calcium carbonate through addition of CO2 were tested. Of these, freeze drying, CO2 addition, and ferro magnetic treatment were shown to be feasible alternatives to present disposal methods. Each of these methods resulted in settled sludge volume reducation of approximately 90% and increases in sludge solids contents of from 0.5 to about 5% after 30 min. settling periods. The ferro magnetic process has the advantages of possible recovery of a useful product, and elimination of costly settling lagoons, but is very sensitive to aluminum and requires a considerable amount of heat. Sludge freezing is the simplest conceptual approach and is

apparently effective for any lime produced sludge. The CO2 addition method offers the possibility of partial recovery and recycling of both CaO and CO2 through sludge calcination.

PB-203 190
Johns-Manville Products Corp., Manville, N.J.
ROTARY PRECOAT FILTRATION OF SLUDGE FROM ACID MINE DRAINAGE NEUTRALIZATION.
Water pollution control research series,
T. S. Brown. May 71, 128p W71-13516, EPA-WQO-14010-DII-05/71
Paper copy available from GPO $1.25 as stock no. 5501-0096.

Descriptors: (*Mine waters, *Neutralizing), (*Water pollution, Mine waters), (*Sludge disposal, Mine waters), (*Dewatering, *Sludge), (*Coal mines, Mine waters), Filtration, Calcium oxides, Vacuum filtration, Precipitation (Chemistry), Sedimentation, Cost estimates, Limestone.
Identifiers: *Water pollution control, *Mine acid drainage.

A two year study was conducted at 4 locations in Pennsylvania to test the effect of various alkalies and filter aids on rotary vacuum precoat filtration for dewatering of lime neutralization sludge. The process consisted of neutralization, aeration, sedimentation and filtration. Alkalies investigated were limestone, limestone with hydrated lime, calcined magnesite, partially and fully calcined dolomite, and hydrated lime. Filter aids tested included Hyflo, Super-Cel, and Celite 501, 503, and 545. Results from the first three locations indicated limestone and hydrated lime were preferred alkalies and Celite 501 the preferred filter aid. At the 4th site a 27 run factorial experiment investigating the effect of flow rate, limestone feed level, aeration level, and sludge recirculation level on equipment operation and process cost was conducted. Sludge solids content, filtration rate, and sludge recirculation were found to be significant variables affecting process cost. Estimated operating costs for a 1.5 MGD treatment plant using lime neutralization were $1.16/1000 gallons treated or $8.02 per 100 lbs of acidity treated.

PB-203 191
International Minerals and Chemical Corp., Skokie, Ill.
UTILIZATION OF PHOSPHATE SLIMES.
Water pollution contral research series,
Srini Vasan. Aug 71, 141p W71-13517, EPA-WQO-14050-EPU-08/71
Paper copy available from GPO $1.25 as stock no. 5501-0097.

Descriptors: (*Phosphate deposites, *Materials recovery), (*Lightweight aggregates, *Phosphates), (*Mining, *Industrial waste treatment), Clays, Pelleting, Lightweight concretes, Slurries, Spoil, Dewatering, Fluidized bed processors, Kilns.
Identifiers: *Phosphate mining, *Phosphate rock slime, *Solid waste disposal.

Phosphate slimes have been produced by the Florida phosphate mining industry at the rate millions of cubic yards per year and the volume is increasing. The water retentive characteristics of the clays which are mined with the rock are such that there is more volume of phosphate slime to dispose of than there was actual rock mined. Small scale tests of the slimes were made to assess the feasibility of their use as building materials. A process was developed and demonstrated to be capable of producing a pelletized, light-weight aggregate, and finally a light-weight concrete from the slimes. The four major processing steps: pumping of clay slurries of 3 to 30% solids; slime drying in a fluid bed dryer; pelletizing the dried product and kilning the product to a suitable aggregate, were investigated in batch and suitable equipment was selected. Aggretage production could use up to 6-8 million tons of clay solids annually, releasing up to 5 billion gallons of water to the environment.

PB-203 192
Detroit Metro Water Dept., Mich.
DEVELOPMENT OF PHOSPHATE REMOVAL PROCESSES. DEVELOPMENT AND DEMONSTRATION OF PHOSPHATE REMOVAL FACILITIES AT DETROIT USING AN ACTIVATED SLUDGE PROCESS AND STEEL PICKLING LIQUOR.
Water pollution control research series.

Jul 70, 65p W71-13518, EPA-WQO-17010-FAH-07/70
Grant WPRD-51-01-67
Paper copy available from GPO $0.65 as stock no. 5501-0114.

Descriptors: (*Chemical removal (Sewage treatment), *Phosphates), (*Sewage treatment, Phosphates), (*Pickling compositions, Sewage treatment), (*Phenols, Chemical removal (Sewage treatment)), Activated sludge process, Aeration, Precipitation (Chemistry), Centrifuging, Pilot plants, Feasibility, Trickling filters, Industrial wastes, Iron chlorides, Design criteria, Waste disposal.
Identifiers: Liquid waste disposal.

Over 50 experiments were performed on various wastewater treatment processes at a 200 gpm facility over a 20 month period. Major processes tested included chemical pre-treatment, activated sludge, plastic media trickling filters, deep tank aeration, and activated sludge disposal. Trickling filters were determined to be unsuitable, and the decision was made to design the full scale plant as an activated sludge plant that could be arranged in both the conventional and step feed process variations. The plant design should include deep tank aeration, and phosphate removal by injection of steel pickling liquor. Sludge disposal units investigated included vacuum filtration, centrifugation and filter pressing, but further research was deemed necessary before the selection of a single unit. 87% phenol reduction was achieved in the biological oxidation process, somewhat below the 97% removal required. This lower removal percentage indicated the necessity of further investigations.

PB-203 206
McDonnell Douglas Astronautics Co., Newport Branch, Calif. Astropower Lab.
USE OF IMPROVED MEMBRANES IN TERTIARY TREATMENT BY REVERSE OSMOSIS.
Water pollution control research series,
H. K. Bishop. Dec 70, 76p* W71-13513, EPA-WQO-17020-DHR-12/70
Contract EPA-WQO-14-12-417

Descriptors: (*Water reclamation, *Desalting), (*Membranes, Desalting), (*Sewage treatment, *Demineralizing), (*Cellulose acetate, Membranes), Osmosis, Activated carbon treatment, Chemical removal (Sewage treatment), Nutrients, Regeneration (Engineering), Field tests, Flux (Rate), Casting, Fabrication.
Identifiers: *Reverse osmosis, *Tertiary sewage treatment, *Tubular membranes.

A reverse osmosis study with a threefold objective was conducted. Tubular membranes prepared from trans esterified cellulose acetate were compared with membranes made from commercially available cellulose acetate (control). Next an evaluation was conducted of the in-situ regenerable membrane reverse osmosis design on wastewater. Finally the membranes were subjected to carbon treated secondary effluents, primary effluents, and concentrated primary effluents. Results showed that the modified tubular membranes produced fluxes slightly greater than the control membranes, while in-situ regenerable membranes produced fluxes significantly below those obtained with tubular units. On carbon treated secondary effluents, modified tubular membranes produced an overall average product water flux of 15 gfd, compared to 10 gfd for the control. Initial levels were 15 and 25 gfd for the control and the modified membranes respectively, and these fluxes could be maintained by cleaning every 10 days with an enzyme presoak. Flux for the concentrated primary effluent (9 times the solids in primary effluent) stabilized at 4 to 5 gfd. Removal of wastewater constituents remained nearly constant at 90 to 100% for all three feeds, thus establishing the technical feasibility.

PB-203 207
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
A STATE-OF-THE-ART REVIEW OF METAL FINISHING WASTE TREATMENT.
Water pollution control research series.

Nov 68, 88p W71-13514, EPA-WQO-12010-EIE-11/68
Grant WPRD-201-01-68
Paper copy available from GPO $1.00 as EP 2.10:12010EIE.

Descriptors: (*Water pollution, *Industrial wastes), (*Metal finishing, *Industrial waste treatment), (*Electroplating, Industrial waste treatment), (*Cyanides, Industrial waste treatment), (*Chromium, Industrial waste treatment), Reviews, Detoxification, Sewage treatment, Nickel, Copper, Zinc, Chlorination, Hypochlorites, Reduction (Chemistry), Sulfurinorganic compounds, Cost estimates, Bibliographies.
Identifiers: *Water pollution control.

Water borne wastes generated in the electroplating and metal finishing industry include: Rinse waters from plating, cleaning, and other surface finishing operations; Concentrated plating and finishing baths that are accidentally or intentionally discharged; Wastes from plant or equipment clean up; Sludges, filter cakes, etc.; Regenerants from ion exchange units; and Vent scrubber waters. Control measures discussed include in-plant control measures for waste reduction, as well as chemical, physical, and biological detoxification techniques for the various waters to be treated. The methods presented were developed for use by the large scale manufacturing operations and are now presented for the benefit of the small operator. Evaluation and cost estimation of these techniques as applied to smaller operations will be a major objective of investigatuons in subsequent phases of the program.

PB-203 208
American Public Works Association, Chicago, Ill. Research Foundation.
PREVENTION AND CORRECTION OF EXCESSIVE INFILTRATION AND INFLOW INTO SEWER SYSTEMS. A MANUAL OF PRACTICE.
Water pollution control research series.

Jan 71, 115p W71-13568, EPA-WQO-11022-EFF-01/71
Contract EPA-WQO-14-12-550
Paper copy available from GPO $1.25 as stock no. 5501-0053.

Descriptors: (*Sewers, *Water influx), (*Sanitary engineering, Sewers), Manuals, Construction, Ground water, Sources, Fluid infiltration, Sewer pipes, Inspection, Storm sewers, Combined sewers, Sanitary sewers, Surface water runoff, Joints (Junctions), Design standards, Legislation, Cost estimates.

The manual is intended to serve as a guide to officials of local public agencies in evaluating sewer construction practices and in making field surveys of infiltration of ground waters and inflows from various sources. Guidelines are also presented for making economic analyses of the cost of excessive

infiltration and inflow, and for instituting corrective action. The problem is especially serious in the case of sanitary sewer systems in urban areas. Such systems are designed to carry only sanitary wastes, and a reasonable standard allowance is made for unavoidable entry of ground and surface waters. The illegal connection of roof leaders and foundation drains to sanitary sewer systems is the principal source of inflow. Improvements in inspection of construction and testing of completed sewer lines will promote the use of better materials and good construction practices. The use of air for infiltration testing and water for exfiltration testing is described. Exerpts from sewer control legislation are given. Codes, standards, specifications, and suggestions for sewer design, construction, inspection, repair and cleaning are discussed.

PB-203 289
Metcalf and Eddy, Inc., Palo Alto, Calif.
STORM WATER MANAGEMENT MODEL. VOLUME I - FINAL REPORT.
Water pollution control research series.
Jul 71, 365p W71-13370-1, EPA-WQO-11024-DOC-07/71
Contract FWPCA-14-12-501
Sponsored in part by University of Florida, Gainesville, Contract FWPCA-14-12-502 and Water Resources Engineers, Inc., Walnut Creek, Calif. Contract FWPCA-14-12-503. Paper copy available from GPO $2.75 as stock no. 5501-0109. See also Volume 2, PB-203 290.

Descriptors: (*Computerized simulation, *Surface water runoff), (*Sanitary engineering, Surface water runoff), Rainfall intensity, Storm sewers, Computer programming, Economic analysis, Water quality, Water pollution, Urban areas, Benefit cost analysis, Combined sewers, Management planning, Water influx, District of Columbia, Overflows, Hydrographic surveys, Mathematical models.
Identifiers: *Storm water runoff, San Francisco (California), Philadelphia (Pennsylvania), Cincinnati (Ohio).

A comprehensive mathematical model, capable of representing urban storm water runoff, has been developed to assist administrators and engineers in the planning, evaluation, and management of overflow abatement alternatives. Hydrographs and pollutographs (time varying quality concentrations or mass values) were generated for real storm events and systems from points of origin in real time sequence to points of disposal (including travel in receiving waters) with user options for intermediate storage and/or treatment facilities. Both combined and separate sewerage systems may be evaluated. Internal cost routines and receiving water quality output assisted in direct cost-benefit analysis of alternate programs of water quality enhancement. Demonstration and verification runs on selected catchments, varying in size from 180 to 5,400 acres, in four U.S. cities (approximately 20 storm events, total) were used to test and debug the model. The amount of pollutants released varied significantly with the real time occurrence, runoff intensity duration, prestorm history, land use, and maintenance. Storage-treatment combinations offered best cost-effectiveness ratios. (Author)

PB-203 290
Metcalf and Eddy, Inc., Palo Alto, Calif.
STORM WATER MANAGEMENT MODEL. VOLUME II. VERIFICATION AND TESTING.
Water pollution Control research series.

Aug 71, 185p W71-13370-2, EPA-WQO-11024-DOC-08/71
Contract FWPCA-14-12-501
Sponsored in part by University of Florida, Gainesville, Contract FWPCA-14-12-502 and Water Resources Engineers, Inc., Walnut Creek, Calif. Contract FWPCA-14-12-503. Paper copy available from GPO $1.50 as stock no. 5501-0108. See also Volume 1, PB-203 289 and Volume 3, PB-203 291.

Descriptors: (*Computerized simulation, *Surface water runoff), (*Sanitary engineering, Surface water runoff), Mathematical models, Sampling, Field tests, Performance evaluation, Urban areas, Storm sewers, Combined sewers, Computer programming, Benefit cost analysis, Water quality, Water pollution, Management planning, Water influx, District of Columbia, Overflows, Hydrographic surveys.
Identifiers: *Storm water runoff, San Francisco (California), Philadelphia (Pennsylvania), Cincinnati (Ohio).

The report presents the verification and testing of a comprehensive mathematical model, capable of representing urban storm water runoff to assist administrators and engineers in the planning, evaluation, and management of overflow abatement alternatives. Hydrographs and pollutographs (time varying quality concentrations or mass values) were generated for real storm events and systems from points of origin in real time sequence to points of disposal (including travel in receiving waters) with user options for intermediate storage and/or treatment facilities. Both combined and separate sewerage systems may be evaluated. Internal cost routines and receiving water quality output assisted in direct cost-benefit analysis of alternate programs of water quality enhancement. Demonstration and verification runs on selected catchments, varying in size from 180 to 5,400 acres, in four U.S. cities (approximately 20 storm events, total) were used to test and debug the model. (Author)

PB-203 291
Metcalf and Eddy, Inc., Palo Alto, Calif.
STORM WATER MANAGEMENT MODEL. VOLUME III. USER'S MANUAL.
Water pollution control research series.

Sep 71, 375p W71-13370-3, EPA-WQO-11024-DOC-09/71
Contract FWPCA-14-12-501
Sponsored in part by University of Florida, Gainesville, Contract FWPCA-14-12-502 and Water Resources Engineers, Inc., Walnut Creek, Calif. Contract FWPCA-14-12-503. Paper copy available from GPO $2.75 as stock no. 5501-0107. See also Volume 2, PB-203 290 and Volume 4, PB-203 292.

Descriptors: (*Computerized simulation, *Surface water runoff), (*Sanitary engineering, Surface water runoff), Programming manuals, Sampling, Urban areas, Storm sewers, Combined sewers, Computer programming, Hydrographic surveys, Water quality, Water pollution, Management planning, Water influx, Overflows, Rainfall intensity, Mathematical models, Economic analysis, Benefit cost analysis.
Identifiers: *Storm water runoff.

The report is a user's manual for a comprehensive mathematical model, capable of representing urban storm water runoff, to assist administrators and engineers in the planning, evaluation, and management of overflow abatement alternatives. Hydrographs and pollutographs (time varying quality concentrations or mass values) were generated for real storm events and systems from points of origin in real time sequence to points of disposal (including travel in receiving waters) with user options for intermediate storage and/or treatment facilities. Both combined and separate sewerage systems may be evaluated. Internal cost routines and receiving water quality output assisted in direct cost-benefit analysis of alternate programs of water quality enhancement. (Author)

PB-203 292
Metcalf and Eddy, Inc., Palo Alto, Calif.
STORM WATER MANAGEMENT MODEL. VOLUME IV. PROGRAM LISTING.
Water pollution control research series.

Oct 71, 256p W71-13370-4, EPA-WQO-11024-DOC-10/71
Contract FWPCA-14-12-501
Sponsored in part by University of Florida, Gainesville, Contract FWPCA-14-12-502 and Water Resources Engineers, Inc., Walnut Creek, Calif. Contract FWPCA-14-12-503. Paper copy available from GPO $2.00 as stock no. 5501-0105. See also Volume 3, PB-203 291.

Descriptors: (*Surface water runoff, *Computerized simulation), (*Sanitary engineering, Surface water runoff), Computer programs, Mathematical models, Sampling, Storm sewers, Combined sewers, Hydrographic surveys, Rainfall intensity, Management planning, Water quality, Water pollution, Water influx, Overflows, Economic analysis, Benefit cost analysis, Urban areas.
Identifiers: *Storm water runoff.

The report presents the program listing for a comprehensive mathematical model, capable of representing urban stormwater runoff to assist administrators and engineers in the planning, evaluation, and management of overflow abatement alternatives. Hydrographs and pollutographs (time varying quality concentrations or mass values) were generated for real storm events and systems from points of origin in real time sequence to points of disposal (including travel in receiving waters) with user options for intermediate storage and/or treatment facilities. Both combined and separate sewerage systems may be evaluated. Internal cost routines and receiving water quality output assisted in direct cost-benefit analysis of alternate programs of water quality enhancement. (Author)

PB-203 341
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
HYDROCHLORIC ACID AND AIR POLLUTION: AN ANNOTATED BIBLIOGRAPHY.

Jul 71, 114p AP-100
Paper copy available from GPO $0.55 as stock no. 5503-0019, EP4.9:100.

Descriptors: (*Air pollution, *Hydrogen chloride), (*Bibliographies, Air pollution), Abstracts, Hydrochloric acid, Industrial plants, Chemical industry, Public health, Toxicology, Atmospheric corrosion, Economic factors, Legislation, Sources, Corrosive gases, Plants (Botany), Standards.
Identifiers: Air pollution effects (Animals), Air pollution effects (Plants), Air pollution effects (Materials), Air pollution control, Air pollution detection, Air pollution standards.

Approximately 164 abstracts of publications on hydrochloric acid, are presented in this bibliography - The abstracts are represented in the following categories: Emission sources; Atmospheric interaction; Measurement Methods; control methods; Effects on human health. Effects on plants and livestock; Effects on material; Effects on economics; Legal and administrative; Standards and criteria; Basic science and technology.

PB-203 355
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
CHLORINE AND AIR POLLUTION: AN ANNOTATED BIBLIOGRAPHY.

Jul 71, 108p AP-99
Paper copy available from GPO $0.55 as stock no. 5503-0018, EP4.9:99.

Descriptors: (*Air pollution, *Chlorine), (*Air pollution control equipment, Chlorine), (*Bibliographies, Air pollution), Abstracts, Sources, Industrial plants, Chemical industry, Public health, Toxicology, Atmospheric corrosion, Economic factors, Legislation, Plants (Botany), Corrosive gases, Standards.
Identifiers: Air pollution effects (Animals), Air pollution effects (Plants), Air pollution effects (Materials), Air pollution control, Air pollution detection, Air pollution standards.

A compilation of approximately 162 abstracts of documents and articles on chlorine is presented. These abstracts cover the following categories of air pollution information: Emission sources; Atmospheric interaction; Measurement methods; Control methods; Effects-Human health; Effects-Plants and livestock; Effects-Materials; Air quality measurement; Standards and criteria; Basic science and technology.

PB-203 356
Research Triangle Inst., Durham, N.C. Statistics Research Div.
PREVALENCE OF CHRONIC RESPIRATORY DISEASE IN CHATTANOOGA: EFFECTS OF COMMUNITY EXPOSURE TO NITROGEN OXIDES.
Final rept.,
Benjamin Carpenter, W. Kenneth Poole, and Donald W. Jackson. 25 Jun 71, 62p RTI-SU-572 APTD-0720
Contract EPA-CPA-70-135

Descriptors: (*Respiratory diseases, *Nitrogen oxides), (*Air pollution, Nitrogen oxides), (*Public health, Air pollution), Tennessee, Epidemiology, Students, Adolescence, Lungs, Carbon monoxide, Respiration, Smoking, Population (Statistics).
Identifiers: Lung function tests, *Chattanooga (Tennessee).

The prevalence of chronic respiratory illness among 3,500 parents of high school students was studied in Chattanooga during the last quarter of 1970. Data were obtained from parents of students in four senior high schools, the neighborhoods of which had an exposure gradient to atmospheric nitrogen dioxide. The smoking habits of respondents were measured by the usual questionnaire techniques and by carbon monoxide concentrations in alveolar breath samples. Lung function was measured by one second forced expiratory volume (FEV) tests. Breath carbon monoxide levels were correlated with smoking habits, FEV and severity rating of chronic respiratory illness. FEV test results, corrected for height, age, sex, race, and CO, were singificantly lower among sample parents living in the high-nitrogen dioxide exposure area. Residents of that area did not show a significantly higher prevalence of chronic respiratory illness.

PB-203 358
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
SURVEY OF COMMERCIALLY AVAILABLE CATALYST AND SORBENT MATERIALS.
Summary rept.,
R. H. Cherry, Jr., D. P. Moon, S. A. Rubin, and R. T. Niehoff. 17 Jul 69, 318p* APTD-0685
Contract PH-86-68-84

Descriptors: (*Catalysts, *Catalogs (Publications)), (*Adsorbents, Catalogs (Publications)), (*Air pollution control equipment, Chemical compounds), Tables (Data), Cost estimates, Chemical properties, Utilization, Computer programming, Data acquisition, Surveys, Physical properties.

An abbreviated catalog of catalyst, carrier and sorbent materials has been prepared from published and available manufacturer's information. Information on types, properties, usages, and costs has been collected. This information has been extracted and assembled for sorting, adjusting, arranging, and printing in logically meaningful arrays using a specially-developed Fortran IV catalog logic compatible with the CDC 6400 digital computer. The catalyst materials survey is useful in its present form for data storage and comparison, for screening, and as a decision-making tool. It cannot at present provide the guidelines or criteria for designing or choosing new catalyst-material candidates.

PB-203 400
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING OF COAL RESERVES BY SULFUR LEVEL: GENERAL DOCUMENTATION - PART I,
John C. Goodrich, and Howard T. Fisher. Apr 71, 198p APTD-0755
Contract CPA-70-16

Descriptors: (*Coal deposits, *Mapping), (*Sulfur dioxide, Coal deposits), (*Fossil fuels, Air pollution), Computer programming, Sulfur, Coal mines, Graphic methods, Data processing, Automatic mapping.
Identifiers: SYMAP computer program, GRID computer program, SYMVU computer program, Sulfur level, *Air pollution control.

A report is presented of a project which was designed to demonstrate the capabilities of the SYMAP Computer Mapping Program to display the sulfur levels of coal and the quantities of coal available at various sulfur levels. The report presents information in the following sections: SYMAP mapping techniques, GRID and SYMVU techniques, discussion of study area graphics, additional data considerations, and data handling routines. (Author)

PB-203 426
Cordis Corp., Miami, Fla.
WATER MONITORING SYSTEM.
Terminal progress rept. 24 Jun 68-23 Dec 69.

3 Mar 70, 37p W71-13813, EPA-WQO-16030-ENR-03/70
Contract EPA-WQO-14-12-412

Descriptors: (*Water analysis, *Antigen antibody reactions), (*Insecticides, *Antibodies), (*Immunology, *Pesticides), (*DDT, Antibodies), (*Malathion, Antibodies), Antibody formation, Rabbits, Serum albumin, Aldehydes, Adsorption, Scintillation counters.
Identifiers: Acetic acid/bis (Chlorophenyl), Chlorine organic compounds, *Water pollution detection.

The feasibility of producing antibodies to DDT and Malathion derivatives was accomplished by immunizing animals with pesticide-protein complexes in which the protein carrier was derived from the species being immunized. DDA-rabbit serum albumin or Malathion anhydride-rabbit serum albumin conjugates were injected into rabbits in complete Freund's adjuvants at multiple intradermal sites, and antibody responses were encountered by the third or fourth injection. The results demonstrate that (1) it is possible to develop specific antibodies to two pesticide derivatives, DDA and Malathion anhydride (2) these antibodies are highly specific for each pesticide derivative; and (3) given enough time, the technical difficulties which have been encountered in utilizing these antibodies for the development of a highly sensitive immunoassay procedure could be resolved. Such a technique would offer investigators interested in pollution problems a simultaneously highly specific and highly sensitive method for detecting and measuring these pesticides, without the need for preliminary treatment of the samples being investigated. (Author)

PB-203 427
Stochastics, Inc., Blacksburg, Va.
STOCHASTIC MODELING FOR WATER QUALITY MANAGEMENT.

Feb 71, 409p EPA-WQO-16090-DUH-02/71, W71-13824
Contract EPA-WQO-14-12-849
Paper copy available from GPO $3.00 as Stock Number 5501-0104.

Descriptors: (*Stream pollution, Mathematical models), (*Water pollution, Stochastic processes), Water quality, Biochemical oxygen demand, Dissolved gases, Sampling, Statistical analysis, Computer programs, Computerized simulation, Estuaries.
Identifiers: Ohio River, Potomac River.

Because water pollution is a stochastic process, water quality standards must incorporate variability. After reviewing previous deterministic models, the document generalized and extended earlier stochastic models. In particular, the project expanded and verified the Custer and Krutchkoff model. The specific objectives were to: Adapt the model to accept variable or random input loadings; Adapt the estuary model to treat segmented estuaries; Verify the adapted models with data supplied by WQO; Find a method for using data to estimate and predict the stochastic parameter delta. The objectives were successfully achieved and verification accomplished with data from the Ohio River and the Potomac Estuary. The report concluded that the extended Stochastic Model can handle load inputs, rate constants, velocity, temperature, benthal demands, land runoff, hydraulic parameters, geometry, and random pollution inputs. It can accurately predict the time-dependent mean concentration in a transient state condition or pseudo-steady state condition at any point in a stream or estuary. Further, the proportion of time that the BOD, DO and nitrogen concentrations will be above or below any given level can also be predicted accurately. Recommendations were made for further use and expansion of the model. (Author)

PB-203 463
TRW Systems Group, Redondo Beach, Calif.
ANALYSIS AND ADVANCED DESIGN STUDY OF AN ELECTROMECHANICAL TRANSMISSION.

Apr 71, 261p 17220.00 APTD-0762
Contract EPA-EHSH-71-002

Descriptors: (*Automotive transmissions, Design criteria), (*Internal combustion engines, Hybrid propulsion), Motor vehicle drive systems, Automotive engineering, Electric motors, Electric generators, Lead acid batteries, Statistical data.
Identifiers: Electromechanical transmissions, Hybrid vehicular propulsion.

The report deals with the design and data analysis of a heat engine-battery hybrid propulsion system for vehicles. The first portion of the work performed is devoted to the following tasks: evaluation of the performance of the Electromechanical Transmission (EMT) operating on a dynamometer; performance of engineering trade-off studies on the power conditioning units of the Speeder (generator) and Torquer (traction motor) subsystems and presentation of up-graded design criteria; assessment of the performance of the Speeder and Torquer machines and the presentation of design criteria for advanced versions of both machines; development of advanced operational concepts such as start-up techniques and means for up-grading the transfer of the Torquer system between the motor and generator operating states; development of analytic models of Torquer system operation and use of these models to assess the effect of design parameters. The second portion of the study was intended to provide operational data on the performance of an internal combustion engine when used within the context of a hybrid power train. (Author)

PB-203 464
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Toxicology.
GUIDES FOR SHORT-TERM EXPOSURES OF THE PUBLIC TO AIR POLLUTANTS. II. GUIDE FOR HYDROGEN CHLORIDE.

Aug 71, 16p* APTD-0764
Contract CPA-70-57

See also Part 1, PB-199 903, and Part 3, PB-203 465.

Descriptors: (*Air pollution, *Public health), (*Hydrogen chloride, Air pollution), (*Toxicology, Hydrogen chloride), Exposure, Occupational diseases, Animals, Humans, Plants (Botany), Atmospheric corrosion, Gas sampling, Corrosive gases.
Identifiers: *Air pollution effects (Animals), *Air pollution effects (Plants), *Air pollution effects (Humans), *Air pollution detection, Air pollution public emergency limits.

Upon recognition of the fact that occasional peak additions of pollutants to the ambient exposures of the public do occur, work was begun on the preparation of these guides. Primary consideration was given to literature dealing with single or intermittent brief exposures to hydrogen chloride or hydrochloric acid. The guides present threshold levels of exposure and the corresponding responses or effects on: Animals; Man; Vegetation; and Materials. The guide also presents; Short Term Public Limits (STPL's) and Public Emergency Limits (PEL's). Analytical methods for the measurement of hydrogen chloride are also included. (Author)

PB-203 465
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Toxicology.
GUIDES FOR SHORT-TERM EXPOSURE OF THE PUBLIC TO AIR POLLUTANTS. III. GUIDE FOR GASEOUS HYDROGEN FLUORIDE.

Aug 71, 16p* APTD-0765
Contract CPA-70-57
See also Part 2, PB-203 464.

Descriptors: (*Air pollution, *Public health), (*Hydrogen fluoride, Air pollution), (*Toxicology, Hydrogen fluoride), Exposure, Occupational diseases, Animals, Humans, Sources, Corrosive gases, Pathology.
Identifiers: *Air pollution effects (Humans), *Air pollution effects (Animals), Air pollution public emergency limits.

A report is presented which reviews experimental data and histories of exposure to hydrogen fluoride of humans and experimental animals. Specifically reviewed are: clinical and pathological effects of HF; toxicity studies; and instances of apparent HF injury. A discussion is presented of susceptibility of species to HF poisoning. Short-term Public Limits (STPL's) and Public Emergency Limits (PEL's) are also presented. (Author)

PB-203 466
Atomics International, Canoga Park, Calif.
DEVELOPMENT OF A MOLTEN CARBONATE PROCESS FOR REMOVAL OF SULFUR DIOXIDE FROM POWER PLANT STACK GASES.
Progress rept. no. 4, 1 Aug 69-19 Mar 71.

28 Jul 71, 188p* AI-71-37 APTD-0752
Contract CPA-70-78
See also progress rept. no. 2, Pt. 5, PB-191 961.

Descriptors: (*Air pollution, Sulfur dioxide), (*Adsorbents, *Carbonates), (*Sulfur dioxide, *Adsorption), (*Air pollution control equipment, Sulfur dioxide), Fused salts, Chemical reactors, Chemical engineering, Scrubbers, Reduction (Chemistry), Materials recovery, Corrosion, Sulfates, Design criteria, Gas filters, Fly ash, Regeneration (Engineering), Alkali metal compounds, Combustion products, Sulfites, Electric power plants, Performance evaluation.
Identifiers: *Air pollution control, *Waste gas recovery, *Molten carbonate process, Claus process.

The results of the progress development work accomplished on the use of a molten carbonate process to remove SO (x) from power plant gas streams are reported here. The development program for the report period concentrated on: Obtaining additional data on the performance of filters to remove fly ash from the molten salt stream; Studying the effectiveness of mist elimination pads to remove entrained salt from the gas stream exiting from the scrubber; Continuing the materials test program; Completing the design of a materials test loop; Cooperating and assisting Singmaster and Breyer in their evaluation of the process; Completing preliminary engineering analyses of the two region molten carbonate reducer and the generator; and Revising the material and energy balances for 800 and 10 Mw plants. The results of the work on each of these topics are described. (Author)

PB-203 488
Black, Sivalls and Bryson, Inc., Pittsburgh, Pa. Applied Technology Div.
STUDY OF SULFUR RECOVERY FROM COAL REFUSE.
Water pollution control research series,
Paul J. LaRosa, and H. James Michaels. Sep 71, 65p W71-13895, EPA-WQO-14010-FYY-09/71
Contract EPA-14-12-929
Paper copy available from GPO $0.70 as stock no. 5501-0137.

Descriptors: (*Coal mining, *Materials recovery), (*Coal mines, Water pollution), (*Water pollution, *Mine waters), (*Desulfurization, *Pyrite), Spoil, Feasibility, Sulfur, Limestone, Chemical reactors, Hydrogen sulfide, Sulfur dioxide, Economic analysis, Cost estimates, Pelleting, Chemical engineering, Gasification, Sulfide minerals.
Identifiers: *Water pollution control, *Coal mine refuse, Claus process, Mine acid drainage.

During coal preparation, a coal refuse of no commercial value is produced and discarded in piles. As rainfall percolates through the piles, acid waters are formed. A feasibility study has been performed on a process producing sulfur from such coal refuse. In this process, limestone and coal refuse are ground, pelletized, and preheated before entering a desulfurizing shaft reactor where a hard, fired ash pellet and an H2S-SO2 bearing offgas are produced. After sulfur, tar, and other gases are removed, the resulting H2S-SO2 gas proceeds to a conventional sulfur recovery plant. Experimental results and economics of this study indicate that the process is a profitable means of minimizing coal refuse pile water pollution. For a sulfur and ash pellet selling price of $20 and $1.50/ton respectively, it is estimated that a coal producer will have a before tax return on investment up to 53 percent for a one MM ton/year plant utilizing an eight percent sulfur refuse. (Author)

PB-203 489
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
RECOVERY OF OIL SPILLS USING VORTEX ASSISTED AIRLIFT SYSTEM.
Water pollution control research series,
P. C. Walkup, J. D. Smith, and E. R. Simonson. Jul 70, 42p EPA-WQO-15080-DJM-07/70, W71-13896
Contract EPA-14-12-513
Paper copy available from GPO $0.50 as stock no. 5501-0069.

Descriptors: (*Water pollution, Oils), (*Materials recovery, *Oils), (*Separators, Water pollution), Vortices, Vacuum apparatus, Feasibility, Design criteria, Ocean waves, Pumping, Coanda effect, Performance evaluation, Field tests, Emulsions.
Identifiers: *Oil pollution, *Oil pollution recovery, Oil slicks.

Studies were conducted to determine the feasibility of a concept for recovery of floating oil slicks which utilizes a pump induced vortex and a vacuum suction or Coanda nozzle. The apparatus used for developmental experimentation comprised a pumping system for vortex production, a large water basin, a flapper type wave generator, and several configurations of the experimental assembly. The range of influence was smaller than was anticipated. Approximately a 2-foot influence diameter was achieved for the maximum strength vortex generated in this apparatus. Extrapolation of measured performance data showed that a 1/8-inch thick slick could be recovered at the rate of 960 gallons per hour. Experiments with and without a variety of oils showed that enhanced oil recovery rates with the vortex was due entirely to the surface current generated by the vortex. This effect was found to improve oil recovery by a factor of 7.9 above the rates achieved with a suction nozzle alone. The surface position of the vortex cavity was found to be sensitive to surface waves. The cavity moved in a circular path within three vortex cavity radii of the still water cavity location as a wave passed through the assembly. Tests with a Coanda nozzle (a fluid attachment eductor) showed improved performance in surface waves. However, the recovered oil-water mixture was highly emulsified. (Author)

PB-203 493
Edison Water Quality Lab., N.J.
ENVIRONMENTAL IMPACT OF HIGHWAY DEICING.
Water pollution control series,
Ed Struzeski. Jun 71, 124p W71-13898, EPA-WQO-11040-GKK-06/71
Paper copy available from GPO $1.25 as stock no. 5501-0127.

Descriptors: (*Deicing, *Highways), (*Deicers, *Environmental surveys), (*Sodium chloride, *Water pollution), Surface water runoff, Ground water, Surface water, Water supplies, Additives, Corrosion, Urban areas, Plants (Botany), Storage.
Identifiers: *Water pollution effects (Plants).

Deicing agents for removal of ice and snow from highways and streets are essential to wintertime road maintenance in most areas of the U.S. Due to the ever-increasing use of highway deicing materials, there has been growing concern as to environmental effects resulting from these practices. The state-of-the-art report critically reviews the available information on methods, equipment and materials used for snow and ice removal; chlorides found in rainfall and municipal sewage during the winter; salt runoff from streets and highways; deicing compounds found in surface streams, public water supplies, groundwater, farm ponds and lakes; special additives incorporated into deicing agents; vehicular corrosion and deterioration of highway structures and pavements; and effects on roadside soils, vegetation and trees. Highway deicing can cause injury and damage across a wide environmental spectrum. Recommendations describe future research, development and demonstration efforts necessary to assess and reduce the adverse impact of highway deicing. (Author)

PB-203 496
FMC Corp., Princeton, N.J. Central Research Dept.
APPLICABILITY OF INORGANIC SOLIDS OTHER THAN OXIDES TO THE DEVELOPMENT OF NEW PROCESSES FOR REMOVING SO2 FROM FLUE GASES.
Final rept. Jun 69-Jul 70 on Phase 2,
L. D. Friedman. Dec 70, 184p* FMC-PCR-829 APTD-0763
Contract CPA-22-69-92
See also Phase 1, PB-184 751.

Descriptors: (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, *Adsorption), (*Adsorbents, *Carbonates), (*Sodium carbonates, Adsorbents), Bicarbonates, Flue gas, Selection, Silica gels, Aluminum oxides, Fly ash, Copper, Hydroxides, Materials recovery, Regeneration (Engineering), Performance evaluation, Cost estimates, Combustion products, Coal, Electric power generation.

Identifiers: *Waste gas recovery, *Air pollution control.

A summary is provided of the screening studies undertaken to evaluate the following potential agents for removing SO2p impregnated silica gels, impregnated fly ash, hydroxides, sulfides, and sodium carbonates. The report discusses the construction and operation of a sorbent screening unit which is capable of evaluating the sorption characteristics of a given material in less than one hour. The most active sorbents found in these studies were sodium carbonate and sodium bicarbonate. The sodium carbonates were the only materials found in this study which sorbed large amounts of SO2 at 125C, the flue gas exit temperature. A preliminary economic evaluation of the sodium carbonate sorption systems revealed that a regenerable system for an 800 mw plant would cost about $4/ton of coal for removal of 90% of the SO2.

PB-203 497
Alpine Geophysical Associates, Inc., Norwood, N.J.
OIL POLLUTION INCIDENT PLATFORM CHARLIE, MAIN PASS BLOCK 41 FIELD LOUISIANA.
Water pollution control research series.

May 71, 136p W71-13894, EPA-WQO-15080-FTU-05/71
Contract EPA-14-12-860
Paper copy available from GPO $1.25 as stock no. 5501-0130.

Descriptors: (*Water pollution, Oils), (*Offshore drilling, Water pollution), (*Mexico Gulf, Offshore drilling), Oil wells, Marine biology, Ocean currents, Booms (Equipment), Barriers, Ecology, Remote sensing, Louisiana.
Identifiers: *Chevron oil spill, *Oil pollution, Water pollution effects (Animals), Oil pollution control, Block 41 field, Platform Charlie.

For roughly eight weeks (February 10 to March 31, 1970), wells on the Chevron Oil Company platform Charlie in the Main Pass Oil Field (MP41C), Gulf of Mexico, were out of control, spewing crude oil and natural gas into the air from the platform level. The report documents the observed and potential pollution effects, and pollution control efforts connected with the above casualty for the purpose of preparing a timely report. The objective was to put a small multi-discipline team of scientists and engineers in the field to make observations and conduct interviews with participants in the casualty, while the events were still freshly in mind. For the most part, the information presented herein is culled from interviews with Federal, State and local agencies involved in the casualty or with the resources of the area. Off-the-record interviews were held with a representative of the Chevron Oil Company. Information was culled from numerous technical publications, newspapers and from public records. (Author)

PB-203 498
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
CONCEPT DEVELOPMENT OF A HYDRAULIC SKIMMER SYSTEM FOR RECOVERY OF FLOATING OIL.
Water pollution control research series,
John R. Blacklaw, Blaine A. Crea, E. Roger Simonson, and Paul C. Walkup. Apr 71, 91p W71-13897, EPA-WQO-15080-FWP-04/71
Contract EPA-14-12-884
Paper copy available from GPO $1.25 as Stock no. 5501-0068.

Descriptors: (*Water pollution, Oils), (*Materials recovery, *Oils), (*Skimmers, Water pollution), Hydraulic equipment, Sprayers, Bunker oils, Performance evaluation, Design criteria, Feasibility, Booms (Equipment), Ocean currents, Field tests.
Identifiers: *Oil pollution, *Oil pollution removal, Oil slicks.

Efforts are being directed to develop effective countermeasures against floating oil slicks. Mechanical recovery methods, which do not cause additional environmental insult, are most attractive. Such a concept, a hydraulic skimmer, was investigated. Floating headers, providing a linear water spray pattern on the water surface, are attached to an open sea workboat. Sea water is pumped through spray nozzles mounted on the headers to move an oil slick toward the boat. Side mounted chambers are positioned to collect the concentrated floating oil. Recovered fluid is pumped to an onboard separation system from which the oil is transferred to floating tanks or barges and the water is recycled to the spray system. Experimental work was directed toward component development and evaluation of a large system model in a simulated environment. Model experiment results showed, for light oils, 80 to 100 percent effectiveness and oil recovery rates of 6600 to 8700 gph. Results with Bunker fuel were not as good, being on the order of 1300 to 1800 gph and 12 to 30 percent effective in recovering oil from the water surface. (Author)

PB-203 502
PEDCo-Environmental Specialists, Inc., Cincinnati, Ohio.
ADMINISTRATIVE AND TECHNICAL ASPECTS OF SOURCE SAMPLING FOR PARTICULATES.
Final rept.,
Richard W. Gerstle, and Donald J. Henz. May 71, 135p* APTD-0754
Contract EPA-CPA-70-124

Descriptors: (*Air pollution, *Particles), Project planning, Planning, Sampling, Sources, Instructions, Cost estimates, Monitors, Management planning, Field tests, Regulations.
Identifiers: *Air pollution sampling, *Air pollution detection.

The technical and administrative aspects of establishing and conducting a source sampling program within an air pollution control agency are presented. Administrative aspects include legal aspects, organization, personnel and equipment needs, and costs. Technical aspects and a detailed explanation of conducting a source sampling test for particulate matter are described. Sources of error and the magnitude of errors are included. (Author)

PB-203 504
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME IX. GAS RESISTANCE OF PLANTS WITH SPECIAL REFERENCE TO PLANT BIOCHEMISTRY AND TO THE EFFECTS OF MINERAL NUTRITION,
M. Y. Nuttonson. Jan 71, 121p* APTD-0759

Descriptors: (*Air pollution, *Plant pathology), (*USSR, Air pollution), Farm crops, Plant metabolism, Nutrients, Plant nutrition, Exposure, Life (Durability), Bioluminescence, Forage grasses, Carbon 14, Tracer studies, Sulfur dioxide, Plant pigments.
Identifiers: *Air pollution effects (Plants).

A collection of eight selected reports on air pollution investigations conducted in USSR, are presented. The reports deal with the following: An extensive survey of the principal advances in research on the gas resistance of plants and of the causes of plant vulnerability to gas; and a number of investigations conducted in laboratories and on field plots of the Botanical Garden of Perm University in reference to the feasibility of regulating the gas resistance of plants by means of certain nutritional elements, in reference to a number of biochemical and physiological indicators that can be used to solve the problem of diagnostics of the gas resistance of plants and to characterize species differences in their gas resistance, and to determine the minimum-permissible norms of certain air pollutants for individual species of plants.

PB-203 521
Midwest Research Inst., Kansas City, Mo.
PARTICULATE POLLUTANT SYSTEM STUDY. VOLUME II. FINE PARTICLE EMISSIONS,
L. J. Shannon, P. G. Gorman, and M. Retchel. 1 Aug 71, 343p* APTD-0744
Contract CPA-22-69-104
See also Volume 1, PB-203 128, Volume 3, PB-203 522.

Descriptors: (*Air pollution, *Particles), (*Industrial wastes, Particles), Sources, Forecasting, Air pollution control equipment, Dust control, Data acquisition, Particle size, Open pit mining, Electric power plants, Iron and steel industry, Petroleum refining, Fuels, Fertilizers, Bituminous concretes, Foundries, Coal mining, Cements, Chemical industry, Lumbering, Carbon black, Incinerators, Public health, Toxicology, Respiratory diseases, Atmospheric physics, Sampling, Calcium oxide, Agriculture.
Identifiers: Cement industry, Air pollution effects (Humans), Air pollution detection.

A program was conducted to quantify fine-particle emissions (0.01-2 microns) from particulate pollution sources. The primary objective was to use the best data currently available (i.e., 1969-1970) on particle-size distributions of particulates from uncontrolled and controlled sources, fractional efficiency curves for specific control devices, and the degree of application of control equipment on specific sources to estimate the mass and number of fine particles emitted from particulate pollution sources. Secondary objectives were the assessment of (1) the applicability of standard sampling and particle sizing methods to the fine particle regime, and (2) the current understanding of the adverse effects of fine particulate pollutants. This report presents the results of this study.

PB-203 522
Midwest Research Inst., Kansas City, Mo.
PARTICULATE POLLUTANT SYSTEM STUDY. VOLUME III. HANDBOOK OF EMISSION PROPERTIES,
A. E. Vandegrift, L. J. Shannon, E. W. Lawless, P. G. Gorman, and E. E. Sailee. 1 May 71, 613p* APTD-0745
Contract CPA-22-69-104
See also Volume 2, PB-203 521.

Descriptors: (*Air pollution, *Particles), (*Handbooks, Air pollution), (*Industrial wastes, Particles), (*Air pollution control equipment, Particles), Sources, Chemical properties, Physical properties, Electric power plants, Incinerators, Open pit mining, Agriculture, Iron and steel industry, Cements, Lumbering, Chemical industry, Calcium oxide, Refineries, Clays, Acids, Fertilizers, Bituminous concretes, Foundries, Coal mining, Carbon black, Petroleum refining.
Identifiers: *Air pollution control, Cement industry.

A handbook is presented as part of the documentation for a study of particulate air pollution from stationary sources. The objective of the study was to identify, characterize, and quantify the particulate air pollution problem in the U.S. The document delineates the kind and number of stationary particulate sources, the chemical and physical characteristics of both the particulates and carrier gas emitted by specific sources, and the status of current control practices. The first three chapters of the handbook present general background information pertaining to source emission factors and emission rates effluent characteristics, and control technology. The next chapter discusses some of the more important chemical and physical properties of particulates and carrier gas emitted by industrial sources. The remaining chapters present discussions of the major industrial sources of particulate pollutants. (Author)

PB-203 523
Philco-Ford Corp., Newport Beach, Calif. Aeronutronic Div.

ABSORPTION AND EMISSION BY SO2 BETWEEN 1050 AND 1400/CM (9.5-7.1 MICROMETERS).
Final technical rept.,
Darrell E. Burch, John D. Pembrook, and David A. Gryvnak. Jul 71, 59p* U-4947 APTD-0760
Contract EPA-68-02-0013

Descriptors: (*Sulfur dioxide, *Infrared spectra), (*Flue gases, Air pollution), Emission spectra, Absorption spectra, Tables (Data), Water vapor, Carbon dioxide, Temperature, Errors.
Identifiers: *Air pollution detection, Spectroscopic analysis.

The absorption by the V (1) (1151.38/cm) and V (3) (1361.76/cm) bands of SO2 has been studied between 1050 and 1400/cm (9.5-7.1 micrometers). Spectral curves of transmittance have been scanned with approximately 1/cm resolution for more than 200 samples varying in temperature from about 296 K to 575 K and in pressure from 0.01 to 16 atm. The objective was to provide data on SO2 absorption and emission that are required to interpret data obtained in this spectral interval on the emission by smokestack exhausts containing SO2. An extensive table provides information from which the emission between 1050 and 1250/cm can be calculated for temperatures between 296 k and 650 K. Water vapor absorbs and emits so strongly in the region of the V (3) band of SO2 that this band is probably not useful for remote sensing of smokestacks. Therefore, the V (1) band was emphasized. The strengths of the two prominent bands in molecules are: V (1), 371 plus or minus 20 x 10 to the -20th; and V (3), 3020 plus or minus 200 x 10 to the -20th. (Author)

PB-203 546
Environmental Protection Agency, Research Triangle Park, N.C. Div. of Atmospheric Surveillance.
AIR QUALITY DATA FOR 1967 FROM THE NATIONAL AIR SURVEILLANCE NETWORKS (REVISED 1971).

Aug 71, 186p* APTD-0741

Descriptors: (*Air pollution, *Urban areas), (*Rural areas, Air pollution), Tables (Data), Regional areas, United States, Atmospheric concentration, Particles, Aromatic compounds, Metals, Carbon monoxide, Nitrogen oxides, Nitrogen dioxide, Sulfur dioxide, Hydrocarbons, Oxidants, Aldehydes.
Identifiers: *Air quality data, *Continuous Air Monitoring Projects, *National Air Surveillance Networks, Soiling index, Benzopyrenes.

The report presents brief summaries and analyses in addition to basic data tabulations, on particulate and gaseous pollutants gathered during 1967 at the cooperating stations of the various National Air Surveillance Networks (NASN) and similar data from independent state and local sampling networks that have contributed their results to the central air quality data bank. The report contains national summaries of pollutant levels, with illustrations of variations in the levels of gaseous pollutants. The report also presents tables of data on the following groups of pollutants: Urban and nonurban suspended particulate matter; urban and nonurban benzene-soluable organic constituents; Urban and non urban non metallic inorganic constituents; Urban and nonurban metals; Data is provided on the soiling index related to the following gaseous pollutants: carbon monoxide, nitrogen oxide, nitrogen dioxide, sulfur dioxide, total hydrocarbons, total oxidants, and aldehydes.

PB-203 577
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
RADIATION SAFETY IN X-RAY DIFFRACTION AND SPECTROSCOPY,
Thomas M. Moore, Walter E. Gundaker, and John W. Thomas. Sep 71, 249p BRH/DEP-72-3 FDA-72-8009

Proceedings of a Conference at the University of Pennsylvania, Philadelphia, Pa., 6-7 Jan 70. Prepared in cooperation with University of Pennsylvania, Philadelphia. Paper copy available from GPO $2.00 as HE20.4110:73-3.

Descriptors: (*X ray analysis, *Radiation hazards), (*Laboratory equipment, Radiation hazards), Meetings, X ray spectrometers, X ray diffraction, Public health, Radiobiology, Safety, Radiation measuring instruments, Standards.
Identifiers: *Electromagnetic radiation hazards, X ray radiation leakage.

A conference on radiation safety in x-ray diffraction and spectroscopy was held at the University of Pennsylvania on January 6-7, 1970, to fill the need for improved communications between users of x-ray diffraction and spectroscopy equipment, health physicists, and governmental agencies with regulatory responsibilities. Radiation safety in the use of the equipment was discussed from the viewpoints of the experimentalist and other user-oriented personnel, individuals concerned primarily with radiation safety, and agencies responsible for developing and enforcing guides, standards, and regulations. This report contains the conference proceedings; it includes both the papers presented and the discussions held at the conference. (Author)

PB-203 597
Rocketdyne, Canoga Park, Calif. Research Div.
DEVELOPMENT OF A CHEMICAL DENITRIFICATION PROCESS.
Water pollution control research series,
Frank C. Gunderloy, Jr., Ross I. Wagner, and Victor H. Dayan. Oct 70, 72p W72-00001, EPA-WQO-17010-EEX-10/70
Contract EPA-WQO-14-12-546
Paper copy available from GPO $0.65 as stock no. 5501-0135.

Descriptors: (*Chemical removal (Water treatment), *Nitrates), (*Sewage treatment, *Denitration), (*Chemical removal (Sewage treatment), Nitrates), Iron, Catalysts, Copper, Reduction (Chemistry), Sewage, Potable water, Process variables, Nitrogen oxides, pH, Hydroxides, Carbonates, Phosphates, Nutrients.

Laboratory studies of a chemical denitrification process, namely copper catalyzed ferrous iron reduction of nitrate ion in basic media, demonstrated that denitrification of dilute (10 ppm NO3-N) nitrate solutions to a mixture of innocuous gaseous products was possible. 95 to 98% of the reduced nitrate was in the form of NH3, N2, N2O, NO2 and unreacted NO3. Optimum conditions for reaction were: initial pH near 8 (mole ratio of OH (-)/Fe (++)= 1.5); Mole ratio Fe (++)/NO3 (-) =8; Concentration of catalyst 1-5 ppm Cu (++) with the reaction being carried out under anaerobic conditions; Fe (++) ion derived from the sulfate; NaOH used for pH adjustment; and Phosphate removed and carbonate content decreased. Preliminary investigation of reduction in a continuous flow system was encouraging. The by-product magnetite, was easily separated from the treated water in the absence of appreciable phosphate which inhibits its formation. Data from 280 experiments were tabulated. Cursory studies in potable water and secondary effluent indicate the presence of as yet unidentified inhibitory substances.

PB-203 598
Grumman Aerospace Corp., Bethpage, N.Y.
DEVELOPMENT OF IMMOBILIZED ENZYME SYSTEMS FOR ENHANCEMENT OF BIOLOGICAL WASTE TREATMENT PROCESSES,
Lawrence Slote. Jul 70, 67p W72-00002, EPA-WQO-16050-DXN-07/70
Contract DI-14-12-562
Paper copy available from GPO $0.70 as SN-5501-0113.

Descriptors: (*Sewage treatment, Activated sludge process), (*Enzymes, *Activated sludge process), Separation, Lagoons (Ponds), Colloids, Gels, Bacteria, Aeration, Ribonucleic acids, Amylase, Lipase, Polyacrylamides.

Degradation and utilization of waste water nutrients by microbial action is controlled by a complex enzyme system. In attempts to produce a faster-acting system, a method was developed to biochemically fractionate the microbial enzymes from activated sludge, to concentrate and characterize their activity, and to immobilize this activity by entrapment in a polyacrylamide gel. The enzyme gel preparation was tested for its effect on the biological degradation of a bench-scale activated sludge process. Soluble enzymatic components were readily separated from particulate cell components, and the remaining soluble system was fractioned such that catabolic activity in the enzyme systems of interest was maintained while non-essential components were removed. Immobilization within the gel allowed activity to be maintained during repeated washings, exposure to substrate, and storage. Limited bench-scale tests produced no meaningful results possibly on account of either incomplete polymerization of the gel, an improper activated sludge culture, or both.

PB-203 599
Fram Corp., Providence, R.I.
BIO-REGENERATED ACTIVATED CARBON TREATMENT OF TEXTILE DYE WASTE WATER.
Water pollution control research series,
Clarke A. Rodman, and Edward L. Shunney. Jan 71, 79p* W72-00003, EPA-WQO-12090-DWM-01/71
Prepared in cooperation with Masland (C. H.) and Sons, Carlisle, Pa.

Descriptors: (*Dyes, *Industrial waste treatment), (*Water pollution, Dyes), (*Activated carbon treatment, Dyes), Industrial wastes, Regeneration (Engineering), Adsorption, Biodeterioration, Cost estimates, Industrial engineering, Operating costs, Decoloring, Materials recovery, Field tests, Textile industry.
Identifiers: *Water pollution control, Chemical oxygen demand.

A continual adsorption-biological regeneration cycle of the activated carbon beds treating a dyehouse effluent has been achieved over a four-month period, resulting in a continuous decolorization and organic reduction. The textile dye wastes can be easily decolorized by a single pass flow through fixed granular activated carbon beds at an average flux of 12 gpm/sq ft, provided that the color bodies are receptive to carbon adsorption. The exhausted carbon can then be regenerated biologically provided that the adsorbate is biodegradable. Biological regeneration provided an adsorption capacity in excess of 1.6 lbs COD per lb of carbon, in this instance. Color removal was virtually complete at the two flow rates evaluated. A 1.0 mgd plant was designed. For 50% COD removal estimates were $230,000 for construction and 8.3 cents/1000 gallons for operation. For 75% COD removal, the estimates were $550,000 and 23.1 cents/1000 gallons respectively.

PB-203 619
UNIROYAL, Inc., Naugatuck, Conn. UNIROYAL Chemical Div.
RUBBER REUSE AND SOLID WASTE MANAGEMENT. PART I. SOLID WASTE MANAGEMENT IN THE FABRICATED RUBBER PRODUCTS INDUSTRY, 1968. PART II. WASTE RUBBER AND ITS REUSE, 1968,
Robert J. Pettigrew, and Frank H. Rominger. 1971, 128p EPA-SW-22c-71
Contract PH-86-68-208
Paper copy available from GPO $1.25 as stock no. 5502.0028.

Descriptors: (*Elastomers, Waste disposal), (*Rubber industry, *Waste disposal), (*Materials recovery, Elastomers), Tires, Tire tubes, Regeneration (Engineering), Economic analysis, Cost estimates, Earthfills, Bibliographies, Consumption rate.
Identifiers: *Solid waste disposal, *Waste recycling.

The study defines the solid waste management problem of the fabricated rubber products manufacturing industry for the production year 1968 and examines the reuse potential of the industry's waste, as well as the reuse potential of worn out rubber waste from the consumer, mostly tires and inner tubes. In the manufacture of 10.7 billion pounds of salable rubber products in 1968, it is estimated that 1,058 million pounds of solid wastes had to be disposed of at the fabricating locations and at a disposal cost of about $9.5 million. In most cases, contractors haul solid waste from the plant site for disposal elsewhere, generally to a landfill. For the entire industry, the weighted average cost for both in-plant collection and offsite disposal approximates $18 per ton of solid waste. In the rubber industry, retreaders, reclaimers, and tire splitters are reusing and recycling solid waste; however, the trend is downward for recycle or reuse. Other possibilities for reusing rubber product waste are discussed.

PB-203 620
Louisiana State Univ., Baton Rouge. Dept. of Chemical Engineering.
CONSTRUCTION OF A CHEMICAL-MICROBIAL PILOT PLANT FOR PRODUCTION OF SINGLE-CELL PROTEIN FROM CELLULOSIC WASTES,
C. D. Callihan, and C. E. Dunlap. 1971, 135p EPA-SW-24c-71
Contract PH-86-68-152
Paper copy available from GPO $1.25 as stock no. 5502-0027.

Descriptors: (*Bagasse, Waste disposal), (*Waste disposal, Agricultural wastes), (*Food processing, *Agricultural wastes), (*Proteins, Agricultural wastes), (*Cellulose, Waste disposal), Sugarcane, Fermentation, Corynebacteriaceae, Chemical engineering, Process variables, Amino acids, Refuse disposal, Economic analysis, Food processing, Materials recovery.
Identifiers: *Solid waste disposal, *Waste recycling, *Food supplements, High protein supplements.

The design, construction, and operation of a pilot-plant unit to convert waste sugarcane bagasse into microbial single-cell protein by a previously developed process is described. After the bagasse was ground and given a milk alkaline oxidation treatment it was fermented on a continuous-flow basis by Cellulomonas, sp bacteria, and also by a mixed culture run of Cellulomonas and the symbiotic organism Alealigenea faecalis. Maximum cell density obtained with pure Cellulomonas was 1.7 g dry weight per liter and 6.24 g per liter for the mixed culture. Culture mass-doubling times during log-phase growth were usually from 3.2 to 3.7 hr. The maximum experimental volumetric production efficiency of a continuous run using pure Cellulomonas was about 0.10 g of dry cell mass per liter of fermenter capacity per hr. The single-cell protein, produced as a light brown to yellow-brown powder, has a crude protein content of 50 to 55 percent. (Author)

PB-203 621
Midwest Research Inst., Kansas City, Mo.
THE ROLE OF NONPACKAGING PAPER IN SOLID WASTE MANAGEMENT, 1966 TO 1976. PART I: INTRODUCTION, PART II: THE OUTLOOK FOR NONPACKAGING PAPER, 1966 TO 1976, PART III: THE IMPACT OF NONPACKAGING PAPER ON SOLID WASTE,
William E. Franklin, and Arsen Darnay. 1971, 71p EPA-SW-26c-71
Contract PH-86-67-114
Paper copy available from GPO $0.75 as EP3.2:P19.

Descriptors: (*Paper products, *Waste disposal), (*Waste papers, *Refuse disposal), (*Papers, Consumption rate), Forecasting, Materials recovery, Newsprint, Printing papers, Container board, Sanitary engineering.
Identifiers: *Solid waste disposal, *Waste recycling.

The proportions of nonpackaging paper tonnage that entered the solid waste stream in 1966 and that would do so in 1976 were established. Nonpackaging paper includes such items as newsprint, printing papers, stationery, towels, and household tissues, construction paper and board, and nonwoven disposables. Qualitative and quantitative information about nonpackaging paper was acquired and evaluated to arrive at forecasts of consumption in 1976. Disposal characteristics and rates are discussed. Calculations indicated that 14.3 million tons reached disposal sites in 1966 and this amount is expected to increase by 6.3 million tons by 1976. In pounds per capita, discarded paper will increase from 200 lb in 1966 to 250 lb in 1976, a net change of 25 percent.

PB-203 622
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
SOLID WASTE MANAGEMENT IN RECREATIONAL FOREST AREAS,
Charles S. Spooner. 1971, 104p EPA-SW-16ts-71
Paper copy available from GPO $1.00 as EP3.2:R24.

Descriptors: (*Recreational facilities, *Waste disposal), (*National parks, Waste disposal), Forest land, Cost estimates, Refuse disposal, Food, Collection, Rates (Per time), Earthfills.
Identifiers: *Solid waste disposal, *Sanitary landfills, National forests.

A study was conducted at selected Forest Service districts to establish waste generation rates for major recreational activities and to determine the cost of solid waste handling. Study teams collected solid waste from recreational areas during the study periods and weighed and sorted it into three categories: food wastes, other combustibles, and noncombustibles. Waste quantities produced by each recreational activity were correlated to the use the area had received during a 1-day period of waste accumulation. The standard measure of recreational use was the 'visitor day,' defined as 12-hr use of a recreational facility by one person or use by many persons whose aggregate time in an activity equals 12 hr. Some of the results of the study were that generation rates did not vary regionally or with the level of campground development; that containers were well-designed and maintained; that land-disposal sites were de facto dumps, not operated to local, State, or Federal standards; and that the distance from the Forest Service recreational area to the disposal site and the intensity of recreational use in the area had the most influence on the cost of solid waste collection. (Author)

PB-203 623
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
SANITARY LANDFILL, DESIGN, CONSTRUCTION, AND EVALUATION,
Maxwell J. Wilcomb, and H. Lanier Hickman, Jr. 1971, 15p EPA-SW-88ts-71
Paper copy available from GPO $0.30 as stock no. 5502-0031.

Descriptors: (*Refuse disposal, *Earth fills), (*Sanitary engineering, Earth fills), Recommendations, Site surveys, Operations, Performance evaluation, Design criteria, Urban planning.
Identifiers: *Solid waste disposal, *Sanitary landfills.

The report provides information to help designers, operators, and control agencies achieve and maintain good sanitary landfill practices. Recommendations suggest basic requirements involved in designing and constructing a sanitary landfill. An evaluation method has been developed to measure the level of acceptability of the operations taking place at a disposal site and to provide a comparison of its suitability with that of other evaluated sites. The evaluation provides a tool that a community, organization, consultant, or citizen can use to judge the design and construction of any site under consideration. (Author)

PB-203 674
Utah Water Research Lab., Logan.
COMPUTER SIMULATION OF THE HYDROLOGIC-SALINITY FLOW SYSTEM WITHIN THE UPPER COLORADO RIVER BASIN,
M. Leon Hyatt, J. Paul Riley, M. Lynn McKee, and Eugene K. Israelsen. Jul 70, 263p PRWG-54-1 W72-00084, EPA-WQO-16090-DVU-07/70

Descriptors: (*Rivers, Salinity), (*River basins, Computerized simulation), Water resources, Mathematical models, Analog simulation, Water pollution, Irrigation, Management planning, Computer programs, Wyoming, Utah, Colorado, New Mexico.
Identifiers: Colorado River, San Juan River.

Changes in the hydrologic equilibrium of a river basin resulting from resource development also produce changes in the quality pattern. Since the burden of quality maintenance must be shared by users (just as are quantities) predictions are needed for quality changes which might result from contemplated development at any specified location within the river system. This study reports the development of a computer simulation model of the water and salt flow systems within the Upper Colorado River basin. Because of the close relationship between the hydrologic and salinity flow systems, an understanding of the hydrologic system is essential to successful management of the salinity system. In this study development of a hydrologic model is based on water budgeting or accounting procedures, in which available data on historical water flows, municipal and industrial uses, and the demands of agriculture are used. The salinity dimension is then added, and the joint hydro-salinity model is verified (calibrated and tested) by comparing computed and observed output values. The utility of the model is demonstrated by applying it to a particular subbasin of the San Juan River and predicting the effects on downstream water quantity and quality of developing a large irrigation project within the area. (Author)

PB-203 678
Metropolitan Sewer Board, St. Paul, Minn.
DISPATCHING SYSTEM FOR CONTROL OF COMBINED SEWER LOSSES.
Water pollution control series,
Robert L. Callery. Mar 71, 205p W72-00080, EPA-WQO-11020-FAQ-03/71
Paper copy available from GPO $1.75 as stock no. 5501-0103.

Descriptors: (*Combined sewers, Automatic control), (*Sanitary engineering, Combined sewers), (*Minnesota, *Storm sewers), Surface water runoff, Flow regulators, Urban areas, Rainfall intensity, Computerized simulation, Overflows, Water pollution, Mathematical models, Hydrology, Monitors.
Identifiers: Water pollution control, *Storm water runoff, Saint Paul (Minnesota), Minneapolis (Minnesota).

Results of initial operation of a computer-based data acquisition and control system for a major urban combined sewer system are presented. Impressive reductions in combined sewer overflow pollution of the Mississippi River in Minneapolis

and St. Paul have been effected. Working entirely within the limits of the existing interceptor sewer system, and with relatively minor modifications to selected major combined sewer regulators, incidence of overflow was reduced by 66% and duration of overflow by 88% during most of a rainfall season. Computer simulation techniques using actual rainfall data indicate that the amount of overflow volume reduction achieved is the equivalent of a $200 million separation project. A mathematical model has been developed that will, with rain gage data as input, perform runoff analysis, diversion of combined sewer runoff hydrographs at regulators, and routing of diverted hydrographs through the interceptor system. (Author)

PB-203 679
NUS Corp., Pittsburgh, Pa. Cyrus Wm. Rice Div.
THE EFFECTS OF VARIOUS GAS ATMOSPHERES ON THE OXIDATION OF COAL MINE PYRITES.
Water pollution control series,
John D. Robins, and Joseph C. Troy. Aug 71, 148p W72-00081, EPA-WQO-14010-ECC-08/71
Contract FWPCA-14-12-877
Paper copy available from GPO $1.25 as stock no. 5501-0111.

Descriptors: (*Mine waters, *Water pollution), (*Coal mines, Water pollution), (*Pyrites, *Oxidation), Controlled atmospheres, Air, Nitrogen, Methane, Carbon dioxide, Surface drainage.
Identifiers: *Mine acid drainage, *Water pollution control.

Experiments up to 150 days in length were conducted to study the acid production rate of coal mine pyrites under various gas atmospheres. The gas atmospheres studied were air, nitrogen, methane, and carbon dioxide. The lower limits of the oxidation process were studied by introducing small amounts of oxygen along with the inert blanketing gas and by studying the effects of deaerated versus air saturated feedwater. Acid production was proportional to the available oxygen partial pressure. The acid parameters monitored continued to change and had not completely reached a steady state by the termination of the work. The acid production of nitrogen blanketed pyrite decreased to less than 1% of that of identical columns under air atmosphere. Nitrogen and methane gases were equally effective in reducing acid production. Both of these gases were slightly more effective than carbon dioxide. A large amount of detailed experimental data is presented. (Author)

PB-203 680
Weston (Roy F.), Inc., West Chester, Pa.
COMBINED SEWER OVERFLOW ABATEMENT ALTERNATIVES WASHINGTON, D.C.
Water pollution control series,
Phillip L. Buckingham, Chia S. Shih, James G. Ryan, James A. Lee, and John K. Kane. Aug 70, 240p W72-00082, EPA-WQO-11024-EXF-08/70
Contract FWPCA-14-12-403
Paper copy available from GPO $2.00 as stock no. 5501-0102.

Descriptors: (*District of Columbia, *Storm sewers), (*Sanitary engineering, Combined sewers), (*Combined sewers, District of Columbia), Outfall sewers, Sewage filtration, Design criteria, Surface water runoff, Sewage treatment, Capital costs, Operating costs, Water pollution, Hydrology, Underground storage, Cost estimates, Suspended sediments, Water quality, Monitors, Tunneling (Excavation).
Identifiers: *Storm water runoff, Potomac River, Water pollution control.

Objectives of the project were: Define the characteristics of combined sewer overflow; Investigate the feasibility of high-rate filtration for treatment of combined sewer overflow; and Develop and evaluate alternative methods of solution. Investigative activities included: Review of pertinent reports and technical literature; Field monitoring of combined sewer overflows and separated storm water discharges at three sites; Laboratory studies of ultra-high-rate filtration of combined sewer overflow; Hydrological analysis; and Evaluation of feasible alternatives (based on conceptual design, preliminary cost estimates, and other factors). Reservoir Storage, Treatment at Overflow Points, Conveyance Tunnels and Mined Storage, and Sewer Separation were the approaches considered sufficiently promising for detailed evaluation. Tunnels and Mined Storage with treatment at the Blue Plains plant and at Kingman Lake after subsidence of the storm is recommended. Estimated capital costs (based on the 15-year storm) are $318,000,000 with annual operation and maintenance costs of $3,500,000. This approach also was preferable to the others on the basis of systematic evaluation of reliability, flexibility, public convenience and other non-quantifiable factors. (Author)

PB-203 681
Texas Tech Univ., Lubbock. Dept. of Geosciences.
INFILTRATION RATES AND GROUNDWATER QUALITY BENEATH CATTEL FEEDLOTS, TEXAS HIGH PLAINS.
Water pollution control series,
William D. Miller. Jan 71, 66p W72-00083, EPA-WQP-16060-EGS-01/71
Contract FWPCA-14-12-804
Paper copy available from GPO $0.65 as stock no. 5501-0125.

Descriptors: (*Ground water, Infiltration), (*Feeders, Wastes), (*Cattle, Feeders), Inorganic nitrates, Feeding stuffs, Water pollution, Permeability, Soils, Texas.
Identifiers: *Cattle feedlots.

Detailed field and laboratory studies of five feedlots were conducted to determine field seepage rates and distributive geometry of infiltrated runoff. Practical field seepage rates at these sites ranged from 2 to 20 feet/year. Dispersal rates of ions in the groundwater zone varied from 45 to 400 feet/year. Nitrogen (NO3, NO2, NH4, Org-N) and common chemical parameters (Ca, Mg, Na, K, Cl, SO4, TDS, pH, and conductance) were determined in cores and groundwater samples; based on groundwater analyses from 80 Texas High Plains feedlots, rates of concentration of NO3-N and Cl in groundwater beneath feedlots range from 0.07 to 0.4 p.p.m. per year, and average 0.17 p.p.m. per year. (Author)

PB-203 746
Oklahoma Univ., Norman. Bureau of Water Resources Research.
EVALUATION OF DISPERSED POLLUTIONAL LOADS FROM URBAN AREAS,
Jerry G. Cleveland, George W. Reid, and Jim F. Harp. Apr 70, 224p W72-00355, EPA-WQO-16090-DBX-04/70

Descriptors: (*Surface water runoff, *Water pollution), (*Urban areas, Surface water runoff), Storm sewers, Mathematical models, Dispersing, Watersheds, Nutrients, Bacteria, Seasonal variations, Sedimentation, Sewage, Oklahoma, Field tests, Correlation techniques, Forecasting, Concentration (Composition).
Identifiers: *Tulsa (Oklahoma), *Storm water runoff.

The objective was to develop a technique of evaluating the dispersed pollutional loads from urban runoff. The technique involved analytically determining several pollutant parameters from twelve separate drainage basins, and then correlating the pollution levels to land use practices. The study used the statistical tools of correlation coefficients, component analysis, and multiple regression analysis to develop predictor models for estimating urban dispersed pollutional concentrations and loads. Separate mathematical equations for estimating the expected seasonal bacterial, organic, nutrient, and solid concentrations from urban runoff were developed. The predictors used in the equations were common urban area variables, such as population, population density, commercial establishment density, percentage of streets, and environmental index. Twelve mixed land use drainage basins located in the City of Tulsa, Oklahoma, were used as the test areas. (Author)

PB-203 749
Pacific Northwest Water Lab., Corvallis, Oreg.
OCEAN OUTFALL DESIGN. PART I. LITERATURE REVIEW AND THEORETICAL DEVELOPMENT,
D. J. Baumgartner, and D. S. Trent. Apr 70, 136p* W72-00356, EPA-WQO-16070-DBH-04/70

Descriptors: (*Outfall sewers, *Coasts), (*Water pollution, *Sewage), (*Oceans, Water pollution), Reviews, Water quality, Hydrology, Mixing, Site surveys, Design criteria, Eustuaries, Marine biology, Ocean currents, Heat, Plumes, Mathematical models, Stratification.
Identifiers: *Water pollution control, Thermal pollution.

The growth of population and insutry in the coastal regions of the country, along with increased use of coastal waters for disposal of wastes produced inland, presents the potential of new or increased pollution in a valuable national resource. In order to assure that marine water auality is maintained and enhanced for present and future water uses, each source of waste input must be evaluated for its impact on the environment. Treated wastes must be discharged in such a manner and location that the resulting concentrations and contact times do not violate the water quality requirements specified for the desired water uses. The disposal process can be designed within these constraints through a mix of at least four techniques: degree and type of waste treatment; site selection; outfall or barge distribution of wastes; barrier construction. The report presents a review of the literature pertinent to the theoretical development of present ocean outfall design technology as it applies to waste discharges in general.

PB-203 791
Alaska Univ., College. Inst. of Marine Science.
DYNAMICS OF THE NITROGEN CYCLE IN LAKES.
Final rept.,
Vera Alexander. Mar 70, 220p R71-7 W72-00354, EPA-WQO-16010-DDS-03/70

Descriptors: (*Nitrogen cycle, *Water chemistry), (*Nitrogen fixation, *Fresh water biology), (*Alaska, *Limnology), Lakes, Algae, Nitrogen isotopes, Nitrates, Ammonia, Denitration, Metabolism, Sampling, Labeled substances, Seasonal variations, Nutrients, Water pollution.
Identifiers: Nitrogen 15, *Subarctic regions, *Eutrification.

The importance of nitrogen fixation by blue-green algal populations was established, and nitrogen-15 was introduced for measuring in situ nitrogen fixation rates in natural waters. Nitrogen-15 techniques were developed for measuring nitrate and ammonia uptake, and the importanc3 of ammonia as a nitrogen source in lakes became apparent. Denitrification rates were measured accurately in anoxic lake waters. Rapid ammonia supply and turnover was demonstrated in lake waters. This implies that substantial nitrogen regeneration takes place constantly in surface waters of these lakes, and that this can provide a major nutrient source for the photosynthetic population. Such ammonia supply is independent of any sediment interaction. The limnological information available for interior Alaska has been expanded through the work. The Dumas method using a Coleman nitrogen analyzer were introduced for

preparing nitrogen samples for mass spectrometry. (Author)

PB-203 872
General Research Corp., Santa Barbara, Calif.
MORNING VEHICLE-START EFFECTS ON PHOTOCHEMICAL SMOG,
J. R. Martinez, R. A. Nordsieck, and A. Q. Eschenroeder. Jun 71, 41p* GRC-CR-2-191 APTD-0774
Contract EPA-EHSD-71-22

Descriptors: (*Air pollution, *Exhaust gases), (*Photochemical reactions, *Smog), (*Automobile engines, Starting), Atmospheric diffusion, Hydrocarbons, Sources, Carbon monoxide, Ozone, Nitrogen dioxide, Diurnal variations, Atmospheric composition, California, Computerized simulation.
Identifiers: Los Angeles (California).

The influence of cold-start vehicle emissions on air quality is investigated using a photochemical/diffusion model. Both the time and space distribution of cold starts are examined. A day from an October 1968 Los Angeles smog episode serves as a baseline for determining diffusion coefficients, nitrogen balance, and hydrocarbon reactivities. Vehicular and stationary sources for 1968, 1971, 1974, and 1980 are emission inputs, and pollutant concentrations at the ground are air quality outputs. Stagnant central basin conditions govern the time phasing studies. Emissions introduced during the starting process have the greatest effect of all on carbon monoxide peaks, the effect being to increase the peak CO concentration from 9 to 13 percent. The levels of ozone and nitrogen dioxide that build up later in the day are influenced less because chemical processes afford dilution time. If vehicle starts are decentralized geographically, only a slight increase in the pollutant loading is noted because of the low morning speeds. Based on the results of the study, three possible weighting schemes are proposed for combining cold-start and hot start driving cycles. (Author)

PB-203 952
Institute of Public Administration, Washington, D.C.
GOVERNMENTAL APPROACHES TO AUTOMOBILE AIR POLLUTION CONTROL,
Donald Iafeld, and Gregory Wilcox. 1 Aug 71, 165p* APTD-0766
Contract EPA-EHS-70-126

Descriptors: (*Automobiles, Government policies), (*Air pollution, *Exhaust gases), (*Government policies, Air pollution), (*Law (Jurisprudence), Air pollution), National government, Regulations, Ground vehicles, Abatement, Standards, Law enforcement, Economic analysis, Litigation, Cost estimates, Maintenance, Public opinion, Urban planning, Consumers, Industries, Carbon monoxide, Highway planning, Taxes, Vehicular traffic control.
Identifiers: *Automobile exhaust, *Air pollution control, Air pollution standards.

A report is presented which is directed to the definition and analyses of governmental approaches to control air pollution from privately owned automobiles. The report is separated into three basic components: Average emission per vehicle per mile; Miles of use; and Location of use. Chapter 1 discusses policies aimed at the automotive industries to encourage development of pollution control technology and low pollution fuels. Correspondingly, the range of policies available to induce the motorist to do his part to control average emissions per mile are discussed in Chapter 2. Chapter 3 considers the measures available to reduce the aggregate amount of annual automobile use. Chapter 4 details what urban planners can do to reduce auto pollution emissions in urban areas and facilitate dispersion of existing pollution. The two remaining chapters deal with the relations among these focal points.

PB-203 953
Bonner and Moore Associates, Inc., Houston, Tex.
TAX SYSTEMS TO SUPPORT REDUCTION OF LEAD CONTENT IN MOTOR GASOLINES.

29 Jul 71, 74p* RGH-018 APTD-0772
Contract EPA-68-02-0050-3

Descriptors: (*Taxes, *Antiknock additives), (*Air pollution, Taxes), (*Government policies, Air pollution), (*Automotive fuels, Taxes), (*Lead organic compounds, Antiknock additives), Exhaust gases, Gasoline, Tetraethyl lead, Regulations, Lead, Cost estimates, Octane number, Automobiles, Abatement, Consumers, Economic analysis, Fuel additives.
Identifiers: Automobile exhaust.

A description and interpretation is presented of a study which was conducted to evaluate various tax systems for possible use in supporting federal regulations governing the content of lead alkyl (primarily tetraethyl lead) in motor gasolines. Four schedules were selected for further analysis to explore the use of taxation as an implementation device. The study presents a section on study methodology and study results.

PB-203 958
Chemical Construction Corp., New York. Consulting Div.
THE HIGH SULFUR COMBUSTOR. A STUDY OF SYSTEMS FOR COAL REFUSE PROCESSING. VOLUME I. NARRATIVE SUMMARY.
Final rept.

Feb 71, 237p* APTD-0768
Contract CPA-22-69-151
See also Volume 2, PB-203 959.

Descriptors: (*Air pollution control equipment, *Sulfur dioxide), (*Coal preparation, *Materials recovery), (*Coal, Specifications), (*Desulfurization, Coal preparation), (*Furnaces, Design criteria), Washing, Cost estimates, Economic analysis, Market value, Ash content, Pyrite, Sulfur, Heat treatment, Combustion chambers, Boilers, Particles, Steam electric power generation, Cumbustion products, Air pollution.
Identifiers: *Air pollution control, *Coal (High sulfur), *Waste gas recovery, Cat-Ox process, Claus process.

The pyritic sulfur content of some bituminous coals can be reduced by gravimetric separation or 'washing'. The extraction of energy and sulfur value contained in the reject fractions is technically feasible. Under favorable conditions the sale of extracted energy and sulfur products will to some degree offset the cost of washing. The purpose of the study was to select, design, and evaluate the high sulfur combustor and sulfur recovery process with the greatest potential for utilizing high-ash, high-sulfur coal reject material produced by the deep cleaning of coal. The report therefore includes preliminary designs and evaluations of several combustion and flue gas treating systems for processing high sulfur fuels drawn off from rejects of coal washing. These fuels, will need to be made up to specifications that depend on; the requirements of available processes for sulfur value recovery, and on the limitations of combustion equipment in respect of ash. The 'High Sulfur Content' (HSC) Fuel specifications can be satisfied by appropriately re-combining selected portions of reject material from deep cleaning of coal. Four specimen HSC Fuel compositions are tabulated along with product and cost data on six processing systems for these fuels. (Author)

PB-203 959
Chemical Construction Corp., New York. Consulting Div.
THE HIGH SULFUR COMBUSTOR. A STUDY OF SYSTEMS FOR COAL REFUSE PROCESSING. VOLUME II. DESCRIPTIVE DETAIL.
Final rept.

Feb 71, 530p* APTD-0769
Contract CPA-22-69-151
See also Volume 1, PB-203 958.

Descriptors: (*Furnaces, Design criteria), (*Coal, Specifications), (*Air pollution control equipment, *Sulfur dioxide), Ash content, Combustion, Particle size, Physical properties, Abrasion, Corrosion, Cost estimates, Steam electric power generation, Boilers, Engineering drawings, Combustion products, Air pollution, Materials recovery.
Identifiers: *Coal (High sulfur), *Waste gas recovery, *Air pollution control, Cat-Ox process, Claus process.

The purpose of the report is to evaluate certain combustion systems which are designed to make use of high ash, high sulfur reject materials from coal cleaning by means that will generate steam and permit the recovery of sulfur value. Specific compositions of the rejects were not pre-defined. Specifications of the fuels derived from the rejects ('HSC Fuels') have been developed to accommodate the economics or technical limitations imposed by the processes selected. The scope of the analysis includes both general and specific design considerations in the following order: The HSC Fuel characteristics as determined by variables in composition; Suitability of currently available combustion systems to the proposed boiler design; Specification of the HSC Fuel characteristics required by each combustion system and selection of the combustion system best suited to the process; Preparation of conceptual boiler designs and cost estimates for a 500,000 lb/hr. industrial boiler, a 500 MW (megawatt) utility boiler, and a prototype boiler design at 50 MW capacity. Tests and procedures fo verifying the HSC Fuel characteristics are recommended. The commercial-scale and prototype designs are developed and cost-estimated according to normal proposal standards. (Author)

PB-203 962
American Public Welfare Association, Chicago, Ill.
FEASIBILITY OF COMPUTER CONTROL OF WASTEWATER TREATMENT.
Water pollution control research series.

Dec 70, 83p W72-00408, EPA-WQO-17090-DOY-12/70
Contract FWQA-14-12-580
Paper copy available from GPO $1.00 as stock no. 5501-0145.

Descriptors: (*Sewage treatment, *Automatic control), Computers, Monitors, Automatic control equipment, Sanitary engineering, Cost estimates, Data aquisition, Feasibility.
Identifiers: Computer aided control systems.

A wastewater treatment study was conducted to: Analyze the advantages and limitations associated with the use of computers in the management and control of wastewater treatment facilities; Document potential applications and utilization procedures; and Recommend further research to achieve full computer implementation of wastewater treatment operations and associated management functions. Current problems and procedures were surveyed, including site visits to plants already automated to some extent. In addition, manufacturers were queried as to the availability of the monitoring and controlling equipment needed. Results indicated that management is indeed interested in automatic controls and computer application, but that both will come about largely on a piecemeal basis. Computer hardware and communication equipment is available and is already being utilized in many instances, but many on-line sensing instruments are not available.

PB-203 963
National Canners Association, Berkeley, Calif. Western Research Lab.
REDUCTION OF SALT CONTENT OF FOOD PROCESSING LIQUID WASTE EFFLUENT,
Walter A. Mercer, and Jack W. Ralls. Jan 71, 51p
EPA-WQO-12060-DXL-01/71, W72-00409
Paper copy available from GPO $0.55 as stock no. 5501-0136, EP2.10:12060DXL.

Descriptors: (*Food processing, Industrial waste treatment), (*Water pollution, *Brines), (*Ion exchanging, Industrial waste treatment), (*Water reclamation, *Industrial waste treatment), Sodium chloride, Pilot plants, Performance evaluation, Cost estimates, Ion exchange resins, Regeneration (Engineering).
Identifiers: *Olive processing, *Water pollution control.

Oliver processing brines containing 0.05 to 0.7% sodium chloride were passed through a mixed bed of cation and anion exchange resins in a process known as the Aqua-Ion process. Influent pH, salt content, and COD levels were the particular variables of interest investigated. Sodium chloride levels of 500 to 7000 ppm were subjected to random variations in pH and COD levels, with 94% removal being obtained at 2700 ppm, the optimum for the ranges investigated. Holding pH and COD constant, sodium chloride levels were varied between 600 and 6000 ppm, with resulting effluent concentrations of 150 ppm for influent concentrations of 600, 1000, and 2700 ppm. Influent concentration of 6000 ppm resulted in an effluent concentration of 790 ppm. Calcium hydroxide regeneration was used, with the regenerant being repeatedly cycled through the resin bed to establish the maximum salt concentration attainable in the regenerant effluent. Levels of 3000 ppm were obtained with no indication of leveling off. Pretreatment with activated carbon reduced distributor deposit formation, ennabling possible flow rates of 10,000 gpd. Cost analyses based on pilot plant information predicted a cost of 26 cents per 1000 gallons treated.

PB-203 994
Southwest Research Inst., San Antonio, Tex. Dept. of Automotive Research.
EMISSIONS FROM A GASOLINE- AND DIESEL-POWERED MERCEDES 220 PASSENGER CAR.
Rept. for Apr-Jul 71,
Karl J. Springer. Jun 71, 62p SwRI-AR-813
EPA-CPA-70-44-B
Contract CPA-70-44

Descriptors: (*Air pollution, *Automobile engines), (*Spark ignition engines, Exhaust gases), (*Diesel engines, *Exhaust gases), Hydrocarbons, Carbon monoxide, Nitrogen oxides, Aldehydes, Odors, Particles, Gasoline, Diesel fuels, Comparison, Gas analysis.
Identifiers: *Automobile exhaust, Mercedes Benz 220D.

The project investigated emissions from a typical car with a diesel engine, the Mercedes Benz 220D, and a comparative car with a gasoline engine, the Mercedes Benz 220. Both hydrocarbon and carbon monoxide emissions were over 90% lower in the diesel vehicle. Nitrogen oxides emissions were 50% lower in the diesel vehicle. Other emissions including aldehydes were also measured. The 1972 Federal Test Procedure (CVS) was used for these tests. (Author)

PB-203 999
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
MEASUREMENT OF ELECTROMAGNETIC RADIATION LEVELS FROM SELECTED TRANSMITTERS OPERATING BETWEEN 54 AND 220 MHZ IN THE LAS VEGAS, NEVADA, AREA,
Kenneth R. Envall, Richard W. Peterson, and Sep 71, 65p BRH/DEP-72-4 FDA72-8012
Paper copy available from GPO $0.75 as HE20.4110:72-4.

Descriptors: (*Radio field strength, Measurement), (*Radiation hazards, Radio waves), (*Public health, *Radio waves), Very high frequency, Electromagnetic radiation control, Radio transmitters, Television transmitters, Radiofrequency power, Nevada, Computer programs.
Identifiers: *Radio frequency radiation hazards, *Electromagnetic radiation hazards, Las Vegas (Nevada).

Electromagnetic power levels were measured and compared with theoretical power levels from selected transmitters operating in the frequency range of 54 to 220 MHz in the Las Vegas, Nevada, area. The field measurements were made at 62 grid locations by means of calibrated dipole and biconical antennas. Power variations with respect to antenna height, time of day, distance from a grid point, angular dependence, and terrain were investigated. The data were evaluated in terms of observed and theoretical power levels and converted to power densities for hazards analysis applications. The results indicate that estimates of theoretical power levels should serve as a satisfactory measure of population exposure to electromagnetic energy in the frequency range considered. (Author)

PB-204 011
Solar, San Diego, Calif.
CATALYTIC CONTROL OF NO (X) EMISSIONS FROM MOBILE SOURCES.
Final rept. 1 Jul 70-31 Jul 71,
Manfred I. Seegall, James C. Napier, and William A. Compton. Dec 71, 142p* RDR-1700 EPA-EHS-70-114
Contract EPA-EHSH-70-114

Descriptors: (*Air pollution, Exhaust gases), (*Exhaust gases, Nitrogen oxides), (*Air pollution control equipment, *Motor vehicles), (*Nitrogen oxides, Air pollution control equipment), (*Automobiles, Air pollution control equipment), (*Catalysts, Nitrogen oxides), Catalysis, Rare earth compounds, Platinum, Palladium, Copper inorganic compounds, Monel, Ammonia, Oxides, Performance evaluation, Gas chromatography, Carbon monoxide.
Identifiers: *Catalytic reactors (Exhaust systems), Copper dichromates, *Air pollution control, Automobile exhaust.

The project investigated the use of various catalytic media to control nitrogen oxide emissions from motor vehicles. Laboratory tests of various compounds were conducted. The compounds tested included rare earth oxides, platinum, palladium, copper dichromate, and modified monels. The modified Monel compounds were found most effective in reducing nitrogen oxides. The ammonia formulation of all these catalysts was also measured and was frequently found significant. (Author)

PB-204 012
Southwest Research Inst., San Antonio, Tex. Dept. of Automotive Research.
PUBLIC RESPONSE TO DIESEL ENGINE EXHAUST ODORS.
Final rept. Feb 70-Apr 71,
Charles T. Hare, and Karl J. Springer. Apr 71, 89p
SwRI-AR-804 EPA-CPA-70-44-A
Contract CPA-70-44

Descriptors: (*Public opinion, *Odors), (*Air pollution, Odors), (*Exhaust gases, Odors), Diesel engines, Texas, Buses (Vehicles), Questionnaires, Demography, Surveys.
Identifiers: *Diesel engine exhaust, San Antonio (Texas).

The project investigated public response to various levels of diesel exhaust odor. A mobile laboratory called the Sniffmobile was set up in various areas including shopping centers in the San Antonio area. Volunteers were presented with calibrated samples of diesel exhaust odor. Over 90% of the participants found levels of this odor as experienced from a city bus objectionable. (Author)

PB-204 147
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME I. SUMMARY REPORT. APPENDIX. COMPUTER GRAPHICS.
Final rept.,
John C. Goodrich, and Gail Howrigan. Apr 70, 150p* APTD-0790
Grant NAPCA-68A-2405D
See also Volume 1, PB-204 146 and Volume 2, Report A, Part 1, PB-204 182.

Descriptors: (*Air pollution, *Stereomapping), (*Urban areas, Air pollution), (*Regional planning, Air pollution), Data processing, Computer programming, Atmospheric composition, Maps, Land use, Sulfur dioxide, Particles, Massachusetts, Demographic surveys, Meteorological data, Connecticut, Washington (State), Missouri, California, Pennsylvania.
Identifiers: *Computer mapping techniques, *Air quality data, Computer graphics, SYMAP computer program, Philadelphia (Pennsylvania), Boston (Massachusetts), Saint Louis (Missouri), Kansas City (Missouri), Montreal (Canada), New England, Puget sound, Los Angeles County (California), San Bernardino (California).

The report is an appendix which contains a complete set of all graphics shown in volume I and volume II of a study of computer mapping as applied to air pollution studies.

PB-204 148
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME II. INDIVIDUAL REPORTS. REPORT B. ST. LOUIS REGION STUDY. PART II.
Final rept.,
Steven Fosburg. Apr 70, 58p* APTD-0777
Grant NAPCA-68A-2405D
See also Volume 2, Report A, Part 1, PB-204 182 and Volume 2, Report C, Part 3, PB-204 178.

Descriptors: (*Air pollution, *Stereomapping), (*Urban areas, Air pollution), Missouri, Data processing, Computer programming, Atmospheric composition, Diurnal variations, Maps, Socioeconomic status, Sulfur dioxide, Particles, Meteorological data, Demographic surveys.
Identifiers: *Saint Louis (Missouri), *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A report of an individual case study of the St. Louis, Missouri region is presented. The report is divided into three sections; data analysis considerations, comparison of air quality and socioeconomic data, and diurnal variations in air quality. The appendices include: A discussion of air quality surfaces; A discussion of socio-economic surfaces; and A presentation of computer graphics.

PB-204 174
Esso Research and Engineering Co., Linden, N.J.
A STUDY OF MARKETS FOR AIR POLLUTION MEASUREMENT INSTRUMENTATION 1971--1980,
Rene R. Bertrand. Jun 71, 97p* APTD-0800
Contract CPA-22-69-154

Descriptors: (*Gas detectors, *Marketing), (*Air pollution, *Market research), Forecasting, Instruments, Monitors, Gas sampling, Exhaust gases, Economic analysis, Samplers, Sources, Industries.

Identifiers: *Air pollution detection, Automobile exhaust.

The market for air pollution instrumentation during the decade of the 70's has been determined. The market analysis presented is based on the survey of instrumentation requirements conducted at the federal, state, and local level and on an analysis of current legislation and air pollution control codes. The market was estimated for three areas of measurement instrumentation: ambient level monitoring, stationary source emission measurement, and auto exhaust measurement. This market amounts to nearly one-half billion dollars during the coming decade, some 76% of which represents initial purchases of air pollution measuring equipment. Industry will be the major purchaser of instrumentation accounting for 45% of the market. The market is heavily oriented towards stationary source emission measurement, this area accounting for one-half of the total instrumentation market value. It is shown that the timing is a critical factor in the market with each of the three areas of measurement reaching maturity at different periods during the decade. (Author)

PB-204 175
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
AIR POLLUTION CONTROL ACTIVE RESEARCH GRANTS FOR FISCAL YEAR 1971.

Jul 71, 59p* APTD-0740
See also report for fiscal year 1970, PB-196 410.

Descriptors: (*Air pollution, *Research projects), Grants, Expenses, Public health, Respiratory diseases, Atmospheric corrosion, Exhaust gases, Combustion products, Plants (Botany), Economic analysis, Chemical analysis, Atmospheric motion, Air pollution control equipment.
Identifiers: Air pollution effects (Plants), Air pollution effects (Animals), Air pollution detection, Air pollution control.

A compilation of grant numbers, project titles and investigators, is presented for all research grants which were awarded during the fiscal year 1971, in the following major areas: human health effects; agricultural effects; socio-economic and political studies; physicochemical investigations, development of analytic methods and equipment; meteorology; air pollution source control; and communications. (Author)

PB-204 178
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME II. INDIVIDUAL REPORTS. REPORT C. ST. LOUIS REGION STUDY. PART III.
Final rept.,
Donald S. Shepard. Apr 70, 184p APTD-0778
Grant NAPCA-68A-2405D
See also Volume 2, Report B, Part 2, PB-204 148 and Volume 2, Report D, PB-204 179.

Descriptors: (*Air pollution, *Stereomapping), (*Urban areas, Air pollution), Missouri, Data processing, Computer programming, Atmospheric composition, Maps, Sources, Electric power plants, Demographic surveys, Particles, Sulfur dioxide, Atmospheric motion, Cost estimates, Meteorological data.
Identifiers: *Saint Louis (Missouri), *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A detailed report of an individual case study of the St. Louis, Missouri region is presented. The report is divided into five sections: Air pollution and electric power generation; Elements of the load shifting model; Determination of optimum solution; Operating the loan-shifting model; and conclusions. Two appendices are included in addition to the appendix of computer graphics produced.

PB-204 179
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME II. INDIVIDUAL REPORTS. REPORT D. KANSAS CITY REGION STUDY.
Final rept.,
Elia Werczberger. Apr 70, 112p* APTD-0779
Grant NAPCA-68A-2405D
See also Volume 2, Report C, Part 3, PB-204 178 and Volume 2, Report E, PB-204 191.

Descriptors: (*Air pollution, *Stereomapping), (*Urban areas, Air pollution), Missouri, Data processing, Computer programming, Atmospheric composition, Maps, Sulfur dioxide, Particles, Meteorological data, Demographic surveys.
Identifiers: *Kansas City (Missouri), *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A report is presented of an individual case study of the Kansas City Region. The first section of the report suggests the following processes as possibilities of solutions to the technical problems: Formulation and estimation of background values; Evaluation and manipulation of surfaces on a cell by cell basis; Mapping of information implicit in measurements of air quality data. The second section dealing with air pollution in the Kansas City Standard metropoutan Statistical Area, presents information on data and map preparation and displays map produced in the study.

PB-204 180
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME II. INDIVIDUAL REPORTS. REPORT L. SYMAP INTERPOLATION CHARACTERISTICS.
Final rept.,
Donald S. Shepard. Apr 70, 70p* APTD-0787
Grant NAPCA-68A-2405D
See also Volume 2, Report J. PB-204 195.

Descriptors: (*Air pollution, *Stereomapping), Data processing, Computer programming, Maps, Mathematical models, Atmospheric composition, Interpolation.
Identifiers: Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A technical discussion of SYMAP interpolation characteristics is presented in four sections; The SYMAP interpolation algorithm, Sensitivity and accuracy of interpolation, Use of electives to affect interpolation, and Use of barriers to affect interpolation. Appendices on SYMAP compared to other methods of interpolation and on a map comparison program are included.

PB-204 182
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME II. INDIVIDUAL REPORTS. REPORT A. ST. LOUIS REGION STUDY. PART I.
Final rept.,
Norma Bogen. Apr 70, 85p* APTD-0776
Grant NAPCA-68A-2405D
See also Volume 1, Appendix, PB-204 147 and Volume 2, Report B, Part 2, PB-204 148.

Descriptors: (*Air pollution, *Stereomapping), (*Urban areas, Air pollution), Missouri, Data processing, Computer programming, Atmospheric composition, Maps, Sources, Meteorological data, Sulfur dioxide, Land use, Demographic surveys, Socioeconomic status.
Identifiers: *Saint Louis (Missouri), *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A detailed report is presented of general mapping techniques used during a demonstration study of conceptual, methodogical, and technical approaches to air pollution problems. The report of the St. Louis Region study is divided into two sections; the map system and data banks, and the maps produced in the study. An appendix of computer graphics is also included.

PB-204 183
ITT Electro-Physics Labs., Inc., Columbia, Md.
A SURVEY AND ECONOMIC ASSESSMENT OF THE EFFECTS OF AIR POLLUTANTS ON ELECTRICAL COMPONENTS. VOLUME I - SECTIONS 1 THROUGH 9.
Final rept.

Aug 71, 91p* ETM-179 APTD-0797
Contract CPA-70-72

Descriptors: (*Electric devices, Corrosion), (*Air pollution, Electric devices), Sulfur dioxide, Economic analysis, Failure, Damage, Assessments.

An assessment was made of the economic impact of air pollution on electronic components. To begin the study, electronic components were divided into eleven different categories as defined by the Department of Commerce. The manner and amount of damage from air pollutants that might have been expected in each of these component categories was assessed by surveying the literature describing pollutant material damage mechanisms. The expected effects were compared with the actual experience of major manufacturing companies which appeared to account for most of the sales in each category. Where the literature survey indicated that gaseous sulfur compounds, notably sulfur dioxide, should be expected to account for most of the damage to electronic components, interviews with manufacturers revealed that particulate matter, actually was responsible for most of the electronic component and equipment malfunctions currently being experienced. The economic effects, which were represented by three cost categories, were applied to each component category and then summed to arrive at a total cost of about 15.5 million. (Author)

PB-204 191
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME II. INDIVIDUAL REPORTS. REPORT E. MONTREAL REGION STUDY.
Final rept.,
Jean-Maurice Granger. Apr 70, 60p* APTD-0780
Grant NAPCA-68A-2405D
See also Volume 2, Report D, PB-204 179 and Volume 2, Report F, PB-204 192.

Descriptors: (*Air pollution, Stereomapping), (*Urban areas, Air pollution), Canada, Data processing, Computer programming, Atmospheric composition, Maps, Sulfur dioxide, Particles, Indicator species, Rural areas, Plants (Botany), Land use, Demographic surveys.
Identifiers: *Montreal (Canada), *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program, Epiphyte.

A report of an individual case study of the Montreal, Canada Region is presented. The report is divided into two sections; comparing conventional and biological data for urban areas, and a monitoring technique based on epiphyte sensitivity. Also presented is an introduction discussing the theory and methodology and the mapping techniques. An appendix of a selected bibliography is included in addition to the appendix of computer graphics. (Author)

PB-204 192
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.

COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME II. INDIVIDUAL REPORTS. REPORT F. CONNECTICUT STUDY.
Final rept.,
John C. Goodrich, and Paul Jack Dangermond.
Apr 70, 49p* APTD-0781
Grant NAPCA-68A-2405D
See also Volume 2, Report E, PB-204 191 and Volume 2, Report G, PB-204 193.

Descriptors: (*Air pollution, *Stereomapping), (*Connecticut, Air pollution), Data processing, Computer programming, Atmospheric composition, Maps, Sulfur dioxide, Particles, Urban areas, Rural areas.
Identifiers: *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A detailed report is presented of an air pollution study of State of Connecticut. The projects which comprise this study were initially undertaken because of their relevancy to other study regions and supporting efforts: Measured suspended particulates, for the southern New England Study, and the SYMAP correspondence course; and, Modeled and measured sulfur dioxide, for the modeling of the St. Louis and Boston Region studies. The report is divided into two sections; the SYMAP correspondence course, and modeling air quality.

PB-204 193
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME II. INDIVIDUAL REPORTS. REPORT G. SOUTHERN NEW ENGLAND STUDY.
Final rept.,
William Warntz, John Goodrich, and Steven Fosburg. Apr 70, 56p* APTD-0782
Grant NAPCA-68A-2405D
See also Volume 2, Report F, PB-204 192 and Volume 2, Report I, PB-204 194.

Descriptors: (*Air pollution, *Stereomapping), Data processing, Computer programming, Atmospheric composition, Maps, Particles, Sulfur dioxide, Urban areas, Rural areas, Socioeconomic status, Demographic surveys, Connecticut, Massachusetts, Rhode Island.
Identifiers: *New England, *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A report is presented of a study dealing with computer mapping and the air pollution problems of Southern New England. The study presents an introduction discussing macrogeology and field quantity theory, and income potential as an index of air quality. The second section dealing with application of the study to New England data, includes discussions of air pollution surfaces, socioeconomic surfaces and air quality control regions. An appendix describing a program to determine the critical features of a surface is included.

PB-204 194
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME II. INDIVIDUAL REPORTS. REPORT I. CALIFORNIA STUDY.
Final rept.,
Paul Jack Dangermond. Apr 70, 50p* APTD-0784
Grant NAPCA-68A-2405D
See also Volume 2, Report G, PB-204 193 and Volume 2, Report J, PB-204 195.

Descriptors: (*Air pollution, *Stereochemical mapping), (*California, Air pollution), Urban areas, Rural areas, Computer programming, Data processing, Maps, Particles, Atmospheric composition, Smog, Carbon monoxide, Oxidants, Demographic surveys.
Identifiers: *Los Angeles County (California), *San Bernardino County (California), *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A detailed report is presented of a study dealing with computer mapping and the air pollution problems of California. The study is divided into three sections on; Los Angeles County, San Bernardino County, and the State of California. Each section presents information on monitoring networks and discussion of the maps involved.

PB-204 195
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME 2. INDIVIDUAL REPORTS. REPORT J. BOSTON REGION STUDY.
Final rept.,
John C. Goodrich. Apr 70, 51p* APTD-0785
Grant NAPCA-68A-2405D
See also Volume 2, Report I, PB-204 194 and Volume 2, Report L, PB-204 180.

Descriptors: (*Air pollution, *Stereomapping), (*Urban areas, Air pollution), Massachusetts, Data processing, Atmospheric composition, Maps, Particles, Sulfur dioxide, Demographic surveys.
Identifiers: *Boston (Massachusetts), *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A detailed report is presented on the results of the Boston Region Study as aided by computer mapping. The report is divided into two sections: Data and base maps; and Mapping air quality and emissions data. An introduction discusses the research methodology, some of the technical considerations, and the applicability to control agency programs.

PB-204 196
Teledyne Continental Motors, Muskegon, Mich.
COLLECTION AND ASSESSMENT OF AIRCRAFT EMISSIONS.
Final rept.,
Jose F. Reguerio. 22 Oct 71, 130p TCM-635
Contract EPA-68-04-0035

Descriptors: (*Exhaust gases, *Air pollution), (*Aircraft engines, *Exhaust gases), Spark ignition engines, Tests, Takeoff, Nitrogen oxide (NO), Hydrocarbons, Carbon monoxide, Climbing flight, Gas sampling.

Five engines each of four different models of aircraft piston engines were tested for gaseous emissions (NO, HC, and CO). All of the engines were new engines. In addition, two tests were performed to determine the effect of installing the sample probe in different locations. One test was conducted to determine the effects of various air/fuel ratio settings on an engine at take-off power. (Author)

PB-204 236
DePauw Univ., Greencastle, Ind.
THE EFFECT OF INORGANIC SEDIMENT ON STREAM BIOTA.
Water pollution control series,
James R. Gammon. Dec 70, 150p W72-00851, EPA-18050-DWC-12/70
Paper copy available from GPO $1.25 as SN-5501-0074.

Descriptors: (*Water pollution, *Suspended sediments), (*Fresh water biology, Water pollution), (*Quarrying, Water pollution), (*Fishes, Suspended sediments), Limestone, Mining, Fishes, Turbidity, Growth, Industrial wastes.
Identifiers: *Water pollution effects (Animals), Spawning.

Quantitative effects of stonedust sediment from a crushed limestone quarry on fish and macroinvertebrate populations of an Indiana stream were studied for four years. Light inputs increasing suspended solids loads less than 40 mg/l, resulted in a 25% reduction in macroinvertebrate density. Heavy inputs caused increases of more than 120 mg/l including some deposition of sediment resulted in a 60% reduction in macroinvertebrate population density. Since most taxa responded to the same degree, population diversity indices were unaffected by density changes. Experimental introductions of sediment caused immediate increases in rate of invertebrate drift proportional to the concentration of additional suspended solids. Standing crop of fish decreased drastically when heavy sediment input occurred in the spring but fish remained in pools during the summer when input was heavy and vacated pools only after sediment deposits accumulated. After winter floods removed sediment deposits, fish returned to pools during spring months achieving 50% normal levels by early June. Only spotted bass was resistant to sediment; however, its growth rate was lower below the quarry than above. Most fish were much reduced in standing crop below the quarry.

PB-204 356
Pennsylvania State Univ., University Park. Center for Air Environment Studies.
A STUDY OF THE EFFECTS OF AEROSOL PROPERTIES ON SCATTERING OF LASER LIGHT.
Final rept.,
R. Lee Byers, Douglas W. Cooper, and John W. Davis. 1 Jul 71, 139p APTD-0796
Contract CPA-70-103

Descriptors: (*Aerosols, *Light scattering), (*Optical radar, *Air pollution), (*Particles, *Gas detectors), Backscattering, Humidity, Laser beams, Particles, Depolarization (Waves), Field tests, Alkali metal compounds, Dyes, Particle size.
Identifiers: *Air pollution detection, Alkali halides.

The influence of several variables on the backscattering of laser light by aerosols was studied. He-Ne laser light was used to illuminate aerosol particles generated by a Collison atomizer. The backscattering of light by the particles (effective angle: 173.5) was measured as a function of relative himidity. Depolarization and field studies were also made. Potassium chloride, sodium chloride, and sodium bromide particles all scattered more than twice as much light after becoming droplets. The change in phase occurred at lower humidities than those appropriate for the bulk material. These salt particles depolarized 13 to 25% of the incident polarized light intensity when dry particles and 6 to 12% of the incident light when droplets. The effect of changing ambient relative humidity was also studied for methylene blue dye and uranine dye particles. Depolarization measurements were also made for polystyrene latex and dioctyl phthalate aerosols. These gave depolarizations of 6% and 4% respectively. The laboratory device which measured the backscattering from the aerosols was used in a field test along with a LIDAR device. The field test, while not conclusive, indicated that relative humidity did affect LIDAR measurements. (Author)

PB-204 362
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME X. THE TOXIC COMPONENTS OF AUTOMOBILE EXHAUST GASES: THEIR COMPOSITION UNDER DIFFERENT OPERATING CONDITIONS, AND METHODS OF REDUCING THEIR EMISSION,
M. Y. Nuttonson. 1971, 139p* APTD-0767
See also Volume 9 dated Jan 71, PB-203 504.

Descriptors: (*Air pollution, Exhaust gases), (*Automobile engines, *Exhaust gases), (*Air pollution control equipment, Exhaust gases), (*USSR, Air pollution), Spark ignition engines, Diesel engines, Toxicology, Carburetors, Afterburning, Fuel additives, Catalysts, Gas filters, Motor vehicle engines.
Identifiers: *Automobile exhaust, *Diesel engine exhaust, *Air pollution control, *Catalytic reactors (Exhaust systems), *Thermal reactors (Exhaust systems).

The report contains two articles dealing with investigations relating to the composition and to the methods of control of air pollutants emitted from the exhausts of motor vehicles. A report on neutralizing automobile exhaust gases presents the following information: Composition and toxicity of exhaust gases; Control of exhaust gases; Methods of reducing the formation of toxic components in exhaust gases; Neutralization of toxic components of exhaust gases; and Prospective automobile engines and extent of possible poisoning of the atmosphere by them. The second report discusses the determination of the composition of exhaust gases for carburetor engines under different operating conditions. (Author)

PB-204 363
TRW Systems Group, McLean, Va. Washington Operations.
PROPOSED PERMIT SYSTEM FOR SOURCES OF AIR POLLUTION IN THE STATE OF ALABAMA,
Steven E. Plotkin. Nov 71, 117p 18425.008 APTD-0804
Contract EPA-68-02-0048

Descriptors: (*Air pollution, Control), (*Alabama, Air pollution), (*Licenses, Alabama), Regulations, State government, Site surveys, Inspection.

A description is presented of the Alabama Permit System which is designed to fulfill the requirements for preparation, adoption and submittal of implementation plans. The purpose of the permit system is to administer the source surveillance program and to prevent construction of new sources, or modifications of existing sources, that will violate the rules and regulations of the Air Pollution Control Commission. The report presents information on permit applications, permit units, the process of reviewing permit applications, facility inspections, air pollution control agencies, and data management. (Author)

PB-204 385
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
INVESTIGATION OF THE REACTIVITY OF LIMESTONE AND DOLOMITE FOR CAPTURING SO2 FROM FLUE GAS.
Final rept.,
R. W. Coutant, R. Simon, B. Campbell, and R. E. Barrett. 1 Oct 71, 90p* APTD-0802
Contract CPA-70-111

Descriptors: (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, Adsorption), (*Adsorbents, *Limestone), (*Dolomite (Rock), Adsorbents), Surface area, Particle size, Reaction kinetics, Chemical reactions, Porosity, Temperature gradients, Boilers, Injection, Carbonates, Calcium oxides, Computer programs.
Identifiers: *Air pollution control, CALNOW computer program.

The results are presented of a study program which is closely related to work previously reported on the reaction between limestone and SO2 as applied to the dry-limestone injection process for SO2 control in conventional power-generating boilers. The primary emphasis of the current work has been on clarification of some of the features of the process and on the effect of physical parameters of the stones and limes etc., surface area, porosity, and particle size and of system variables such as temperature of injection, time-temperature profile, and SO2 concentration on the reactivities of selected limestones and dolomites.

PB-204 403
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
SANITARY LANDFILL FACTS,
Thomas J. Sorg, and H. Lanier Hickman, Jr. 1970, 41p EPA-SW-4ts-70
Library of Congress catalog card no. 70-607317.
Paper copy available from GPO $1.00 as HE20.1402:L23-2.

Descriptors: (*Refuse disposal, *Earthfills), Project planning, Public health, Design criteria, Economic analysis, Site surveys, Pest control, Operating costs, Capital costs, Construction equipment.
Identifiers: *Solid waste disposal, *Sanitary landfills.

General information is presented on the sanitary landfill as an effective solid waste disposal method. Emphasis is on areas of planning, design, operation, economics, equipment requirements, and public health. Criteria for selecting a site are developed, as well as general guidelines for the operation of a successful landfill. Public health aspects and nuisance control are stressed; their relation to initial landfill design and operation is shown. On-site facilities and equipment requirements are detailed. Initial investment and operation costs are broken down into outline form. A brief account of factors affecting a completed sanitary landfill includes comparative lists of advantages and disadvantages with this method of disposal. Illustrations are included.

PB-204 404
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
DISMANTLING RAILROAD FREIGHT CARS: A STUDY OF IMPROVED METHODS WITH APPLICATION TO OTHER INDUSTRIAL PROBLEMS,
Dale M. Butler, and William M. Graham. 1969, 39p EPA-SW-3c-69 PHS-Pub-1850
Contract PH-86-67-100
Prepared in cooperation with Booz, Allen Applied Research Inc., Bethesda, Md. Library of Congress catalog card no. 75-603791.
Paper copy available from GPO $0.45 as FS 2.2:F88.

Descriptors: (*Freight cars, *Dismantling), (*Waste disposal, Freight cars), (*Materials recovery, Lumber), Decision making, Railroad cars, Metal scrap, Cost estimates, Combustion, Air pollution, Salvage, Incinerators, Economic analysis, Recommendations.
Identifiers: *Solid waste disposal, Open burning, Air pollution control.

Approximately 70,000 rail freight cars are dismantled each year for the purpose of salvaging reusable parts, scrap iron, and steel. About half of these cars each contain three to seven tons of wood, which must be removed before the scrap can be reused or recycled. To control or eliminate the pollution from open burning of railroad freight cars to remove the wood, alternatives were investigated and evaluated. A forced-decision model, which produces ordinally weighted scores, was devised to aid in selecting alternatives. Two high-scoring methods were a hooded self-incinerator and high-pressure water jets. Further investigation and phototype development on these two methods were recommended. (Author)

PB-204 405
Midwest Research Inst., Kansas City, Mo.
THE ROLE OF PACKAGING IN SOLID WASTE MANAGEMENT 1966 TO 1976,
Arsen Darney, and William E. Franklin. 1969, 217p* EPA-SW-5c-69
Contract PH-86-67-114
Library of Congress catalog card no. 76-601197.
Paper copy available from GPO $2.25 as FS2.2:SO4-8-966-76.

Descriptors: (*Waste disposal, *Packaging materials), (*Management planning, Packaging materials), (*Materials recovery, Packaging materials), Government policies, History, Forecasting, Demographic surveys, Economic analysis, Marketing, Environmental surveys, Taxes, Pollution, Consumption, Growth curves, Collection, Cost estimates, Metals, Glass, Plastics, Textiles, Wood products, Packaging papers, Cans.
Identifiers: *Solid waste disposal, *Waste recycling.

Packaging materials are increasing in quantity much more rapidly than the population, primarily because of the continuing rise in self-service merchandising. Per capita consumption, which was 404 lb in 1958, is expected to be 661 lb in 1976. Until recently, no systematic analysis of the relationship between packaging and solid waste disposal had been undertaken. These interactions are defined, and the differences, with possible solutions, are explored. In the report packaging materials, consumption data from 1959 to 1966 and the outlook from 1966 to 1976 are discussed. Also covered are the areas concerned with disposability, analysis of the collectability, the resistance to disposal and processing, and the salvageability and reuse of packaging materials. Finally the mechanisms are explored to mitigate problems that arise from this type of waste: how research, education, incentive programs, taxes, and regulations can reduce the quantity and reduce the processing difficulties of this disposed material, yet save the natural resources from which packages are made.

PB-204 421
Little (Arthur D.), Inc., Cambridge, Mass.
CHEMICAL IDENTIFICATION OF THE ODOR COMPONENTS IN DIESEL ENGINE EXHAUST.
Final rept. for year 3.

Jun 71, 139p* ADL-62561-5 APTD-0803
Contract EPA-EHSD-71-18
See also rept. for year 2, PB-194 144.

Descriptors: (*Air pollution, Exhaust gases), (*Exhaust gases, *Odors), (*Gas chromatography, Exhaust gases), Diesel engines, Particles, Aromatic compounds, Kerosene, Automotive fuels, Aromatic polycyclic hydrocarbons, Naphthalene compounds, Aromatic monocyclic hydrocarbons, Naphthols.
Identifiers: *Diesel engine exhaust, Indans, Indenes.

The results of a continuing effort to chemically identify the odor components of diesel exhaust are reported. The basic methodology for characterizing and analyzing the diesel exhaust odor was developed during the previous effort on this program. The approach developed involved sensory characterization as an integral part of the study. The experimental approach for analysis of the odor species was to collect large volumes of exhaust by condensation at 0C, extract the organic portion of the exhaust from the non-odorous portion by liquid column chromatography. During this current program, the details of the methodology required for identification of the smoky-burnt odor fraction were completed and applied to the analysis of this fraction. All of the odor-significant species in this fraction have been identified. While several paraffinic oxidation products were recognized as important odor contributers, the most important smoky-burnt odor species are those associated with the partial oxidation products of compounds found in the aromatic fraction of the diesel fuel. (Author)

PB-204 422
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.

COMPUTER MAPPING AS AN AID TO AIR POLLUTION STUDIES. VOLUME II: INDIVIDUAL REPORTS. REPORT H. PUGET SOUND REGION STUDY,
Paul Jack Dangermond, and John C. Goodrich.
Apr 70, 34p* APTD-0783
Grant NAPCA-68A-2405D
See also Volume 2, Report G, PB-204 193.

Descriptors: (*Air pollution, *Stereomapping), (*Puget Sound, Air pollution), Washington (State), Data processing, Computer programming, Atmospheric composition, Maps, Carbon monoxide, Exhaust gases, Cargon dioxide, Hydrocarbons, Urban areas, Land use, Demographic surveys, Transportation.
Identifiers: *Air quality data, *Computer mapping techniques, Computer graphics, SYMAP computer program.

A detailed report is presented of the results the Pudget Sound Region Study. An introduction discussing the areas and method of emission estimating, is followed by two sections. The first section discusses the computer programs and the SYMAP base map. The second section deals with the details involved in the mapping of emissions data. An appendix of computer graphics produced is included.

PB-204 444
Research Triangle Inst., Durham, N.C.
FIELD EVALUATION OF NEW AIR POLLUTION MONITORING SYSTEMS: THE LOS ANGELES STUDY.
Interim rept. 12 May 70-14 Apr 71,
L. F. Ballard, J. B. Tommerdahl, C. E. Decker, T. M. Royal, and D. R. Nifong. Apr 71, 224p* APTD-0775
Contract CPA-70-101

Descriptors: (*Air pollution, *Monitors), (*Sulfur dioxide, Monitors), (*Oxidizers, Monitors), (*Ozone, Monitors), (*Hydrogen sulfide, Monitors), (*Nitrogen dioxide, Monitors), Gas detectors, Performance evaluation, Field tests, Chemiluminescence, Photometers, Colorometers, Coulometers, Flame photometry, Diurnal variations, Tables (Data), Mobile equipment, California.
Identifiers: *Air pollution detection, Air quality data, Los Angeles (California).

The results are reported of a program of which the objective is to conduct a full scale field evaluation in different geographical areas to determine the effects on the response of ambient air analyzers of typical combinations of pollutants in an urban environment. Instruments for measuring SO2 and oxidant in the Los Angeles environment are the principle subjects of the report. Instruments and methods being evaluated include a Gas Phase Chemiluminescent Ozone Photometer, Solid Phase Chemiluminescent Ozone Photometer, a Coulometric Oxidant Analyzer, a Colorimetric Oxidant Analyzer, a Flame Photometric SO2 Analyzer, an Automated West-Galke SO2 Monitor, an Automated GC-FPD SO2, H2S Analyzer, a Coulometric SO2 Analyzer, a Colorimetric NO2 Analyzer, and a Colorimetric H2S Analyzer. Supporting meteorological instrumentation includes wind speed and direction, temperature, solar radiation, and humidity sensors.

PB-204 518
National Environmental Research Center, Cincinnati, Ohio. Analytical Quality Control Lab.
CHARACTERIZATION AND IDENTIFICATION OF SPILLED RESIDUAL FUEL OILS BY GAS CHROMATOGRAPHY AND INFRARED SPECTROPHOTOMETRY.
Interim rept. 1969-1971,
F. K. Kawahara. Oct 71, 48p EPA-16020-MAZ

Descriptors: (*Water pollution, Oils), (*Gas chromatography, Fuel oils), (*Infrared spectroscopy, Fuel oils), (*Law enforcement, Water pollution), Spectroscopic analysis, Infrared spectra, Mixtures, Alkanes.
Identifiers: *Oil pollution detection.

Oil discharges and spills from industrial plants and ships impart unpleasant tastes and odor to water and to game fish and fowl, as well as affect the amenities of beach and recreational facilities. For enforcement actions, it has been useful not only to identify the source of oil spills in the streams, but also to characterize first the petroleum product involved. Methods developed in the last two years at the Analytical Quality Control Laboratory are described; the author presents a workable scheme for the characterization and identification of residual oil pollutants found in surface waters. A powerful aid for the characterization of fuel oil products is stressed. Identity with gas chromatographic and infrared data is given in an elaborate fashion and comparisons are made in the absence of extremely expensive analytical equipment.

PB-204 525
South Tahoe Public Utility District, South Lake Tahoe, Calif.
ADVANCED WASTE WATER TREATMENT AS PRACTICED AT SOUTH TAHOE.
Water pollution control research series,
Russell L. Culp, David R. Evans, and Jerry C. Wilson. Aug 71, 451p W72-01493, EPA-WQO17010-ELQ-08/71
Grant WPRD-52-01-67
Paper copy available GPO $3.25 as EP2.10:17010ELQ08/71.

Descriptors: (*Sewage treatment, *Activated sludge process), (*Water reclamation, Sewage treatment), Calcium oxide, Design criteria, Chlorination, Activated carbon treatment, Roasting, Materials recovery, Cost estimates, Incinerators, Waste disposal, Performance evaluation, California.
Identifiers: *Tertiary sewage treatment, Lake Tahoe, Water pollution control.

A 7.5 mgd advanced wastewater treatment plant at South Lake Tahoe, California has been in uninterrupted operation for three years. Chemical treatment, mixed media filtration, and granular carbon adsorption have been shown to be efficient, reliable, and economical processes for wastewater treatment. A degree of reliability and flexibility comparable to that achieved in electric power generation and water purification has been achieved by appropriate selection and sequencing of unit processes and proper plant design. Plant bypasses have been elimated. Bacteria and viruses have been entirely eliminated from the effluent by small chlorine dosages. Lime has been recalcined in a multiple hearth furnace without air pollution, and granular activated carbon has been successfully regenerated and reused, with stack gasses scrubbed to meet air pollution standards. The wastewater treatment cost has been approximately twice the cost of conventional wastewater treatment.

PB-204 526
Ionics, Inc., Watertown, Mass.
THE ELECTRO-OXIDATION OF AMMONIA IN SEWAGE TO NITROGEN.
Water pollution control research series,
Ljiljana Marincic, and Frank B. Leitz. Jul 70, 51p W72-01494, EPA-WQO-17010-EED-07/70
Contract FWPCA-14-12-800
Paper copy available from GPO $0.55 as EP2.10:17010EED07/70.

Descriptors: (*Chemical removal (Sewage treatment), *Ammonia), (*Sewage treatment, Chemical removal (Sewage treatment)), (*Oxidation, Ammonia), Electrochemistry, Catalysts, Electrodes, Nitrogen, Electrolytic cells, Fluid flow, Platinum.

Laboratory tests were conducted to determine the feasibility of electro-oxidation as a means of removal of ammonia from wastewaters. It was determined that, under conditions of ammonia concentration and pH typical of treatment effluents, the electro-oxidation reaction proceeded stoichiometrically to nitrogen and no other oxidation products. Oxidation occurred in concentrations as low as 2 mg/l of ammonia. Using platinized platinum as an electrode, ammonia decomposition occurred in a narrow potential range with high coulombic efficiency, assuming a three-electron exchange per ammonia molecule. Conversion of nitrogen to the elemental form was demonstrated by analysis of the gas from the anode. No detectable quantities of nitrite, nitrate hydrazine, and hydroxylamine were discovered in the gas. Electric power costs were estimated at $.01/1000 gallons, but cost of the platinum electrodes was prohibitive. Experiments with other electrodes were unsuccessful. Unless less expensive electrodes are developed, the process cannot be economically competetive with other methods.

PB-204 527
Dow Chemical Co., Walnut Creek, Calif.
NITRATE REMOVAL FROM WASTEWATERS BY ION EXCHANGE.
Water pollution control research series,
Robert R. Grinstead. Jan 71, 103p W72-01495, EPA-WQO-17010-FSJ-01/71
Contract FWPCA-14-12-808
Paper copy available from GPO $1.00 as EP.210:17010FSJ1/71.

Descriptors: (*Nitrates, *Chemical removal (Sewage treatment)), (*Amidines, *Anion exchanging), (*Sewage treatment, *Denitration), Alkalinity, pH, Cost estimates, Anion exchange, Guanidines, Adsorption, Materials recovery, Regeneration (Engineering), Sodium hydroxides.
Identifiers: Tertiary sewage treatment.

Alkylated amidines dissolved in an aromatic hydrocarbon were absorbed in macro-porous polystyrene beads to form a water-immiscible extractant system for the removal of nitrate from wastewaters. The amidines are relatively strong bases and possess the advantage over the simple aliphatic amines that they exist in the salt form in contact with wastewaters in the pH range of 7.0 to 8.0. They can, however, be readily regenerated with alkalis, such as ammonia or sodium hydroxide. Amidinium ion in the organic phase selectively extracts nitrate ion over chloride ion by a factor of about 20 (nitrate/chloride ratio in the organic phase is about 20 times the ratio in the equilibrium aqueous phase), and nitrate over sulfate and bicarbonate by much higher ratios. Therefore, amidine systems will pick up mainly nitrate ion from municipal wastes. Seventy bed volumes of a synthetic municipal wastewater containing 62 ppm nitrate ion and 350 ppm chloride ion were treated before breakthrough of nitrate ion in the effluent. Processing costs were estimated currently at 16 cents/1000 gal.

PB-204 577
Pacific Northwest Water Lab., Corvallis, Oreg.
USER'S GUIDE AND DOCUMENTATION FOR OUTFALL PLUME MODEL,
D. J. Baumgartner, D. S. Trent, and K. V. Byram. May 71, 33p Working Paper-80 W72-01491, EPA-WQO-16070-GHV-05/71

Descriptors: (*Pipelines, Discharge), (*Industrial wastes, *Computer programs), (*Water pollution, Industrial wastes), Lakes, Reservoirs, Estuaries, Sea water, Thermal measurements, Sewage, Salinity, Temperature measurement.
Identifiers: PLUME computer programs.

Many users have need for a computational program for analysis of pipeline discharges into lakes, reservoirs, estuaries, or the ocean. This computer program, PLUME, is offered as a standard procedure for analysis of industrial waste, thermal, and sewage streams, incorporating the most recent knowledge of jets and plumes generally applicable. (Author)

PB-204 650
PEDCo-Environmental Specialists, Inc. Cincinnati, Ohio.
FIELD OPERATIONS GUIDE FOR AUTOMATIC AIR MONITORING EQUIPMENT.

Nov 71, 165p* APTD-0736
Contract CPA-70-124

Descriptors: (*Air pollution, *Monitors), Instructions, Handbooks, Field tests, Automation, Maintenance, Calibrating, Specifications, Design criteria, Shelters.
Identifiers: *Air pollution detection, *Automatic air monitoring.

The document is intended as a guide to air pollution control agencies in the selection, installation, and operation of automatic equipment. A summary of the experience gained by control agencies and other selected users over a number of years through operation of automated monitoring equipment is presented. The discussion is limited to suspended particulates, carbon monoxide, hydrocarbons, nitrogen oxide, photochemical oxidants, ozone, and sulfur dioxide. The report is essentially a state-of-the-art treatise on automatic equipment covering such things as: selecting the number and location of sampling stations; shelter design; instrumentation specifications; calibration; installation of equipment; routine operation; maintenance; and data logging. (Author)

PB-204 711
Kellogg (M. W.) Co., Piscataway, N.J. Research and Engineering Development.
EVALUATION OF SO2 - CONTROL PROCESSES.
Final rept. on Task 5.

15 Oct 71, 295p* RED-71-1257 APTD-0807
Contract CPA-70-68

Descriptors: (*Air pollution, Sulfur dioxide), (*Air pollution control equipment, *Sulfur dioxide), (*Electric power plants, Air pollution control equipment), Cost comparison, Design criteria, Cost estimates, Capital costs, Operating costs, Waste disposal, Performance evaluation, Limestone, Scrubbers, Adsorbents, Carbonates, Formates, Ammonia, Magnesium oxides, Zinc oxides, Citrates, Fertilizers, Flue gas, Materials recovery.
Identifiers: *Air pollution control, *Waste gas recovery, Cat-Ox process, Molten carbonate process, Claus process, Potassium formate process, Ammonia scrubbing, TYCO process, Magnesium oxide scrubbing, Zinc oxide process, Citrate process.

The results are reported of technical and economic evaluations of the feasibility of different SO2-control processes. In addition to process evaluations, studies were made of; the applicability of these processes to both power plants and SO2-control processes, and the impact SO2-control technology would have on emission reduction. Preliminary process designs and economic evaluations have been prepared for twelve different SO2-control processes. Investments are reported in millions of dollars for a 1,000 MW plant so the investment cost in dollars per Kilowatt has the same value. The operating costs are reported as dollars per ton of sulfur not emitted, as mills per Kilowatt-hour, and as a percent increase of power cost. Of the twelve processes evaluated none can be ranked as commercially available at the present time. (Author)

PB-204 712
Kearney (A. T.) and Co., Chicago, Ill.
AIR POLLUTION ASPECTS OF THE IRON FOUNDRY INDUSTRY.

Feb 71, 260p APTD-0806
Contract CPA-22-69-106

Descriptors: (*Air pollution, *Industrial wastes), (*Iron and steel industry, Air pollution), (*Foundries, Air pollution), Foundry practice, Melting, Foundry core making, Foundry ingots, Furnace cupolas, Electric arc furnaces, Reverbatory furnaces, Molding techniques, Particles, Oxides, Oils, Carbon monoxide, Dust, Odors, Fluorides, Gas detectors, Gas sampling.
Identifiers: Air pollution detection.

A systems analysis study of the iron foundry industry is presented with particular emphasis on the melting area. The study presents detailed information on the following topics: Trends of the iron foundry industry; The iron foundry process, (which includes; iron production, raw material storage, furnace charge preparation, iron melting, molding, pouring, shakeout, cleaning, heat treating, finishing, sand conditioning, coremaking, and pattern making); Emissions generated and their control; Recommended for testing particulate emissions from iron foundry cupolas. (Author)

PB-204 713
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME 2: INDIVIDUAL REPORTS. REPORT K. COMPUTER PROGRAM MANUALS.
Rept. for 1 Jul 68-21 Dec 69,
John C. Goodrich, and Gail Howrigan. Jun 71, 262p* APTD-0738
Grant NAPCA-68A-2405D
See also Volume 2, Report J, PB-204 195.

Descriptors: (*Air pollution, *Stereomapping), (*Computer programming, Graphic methods), Manuals, Subroutines, Maps, Atmospheric composition, Data processing.
Identifiers: Air quality data, *Computer mapping techniques, *Computer graphics, SYMAP computer program.

The goal of the research was to use computer graphics to clearly display air pollution data over geographical areas. The seven parts of the report are: introduction to the use of the SYMAP program; the data packages of SYMAP; the Map package electives of SYMAP; data banks and user subroutine in SYMAP; technical considerations in the SYMAP program; the user requirements of the SYMVU program; and the user requirements of the GRID program. Each of the seven parts is designed to be used separately or in combination as teaching and reference manuals. The computer program manuals represent the latest versions of the programs. (Author)

PB-204 714
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING AS AN AID IN AIR POLLUTION STUDIES. VOLUME 2. INDIVIDUAL REPORTS. REPORT M. COMPUTER EQUIPMENT AND PROGRAMS.
Allan H. Schmidt. Apr 70, 86p* APTD-0788
Grant NAPCA-68A-2405D
See also Volume 2, Report L, PB-204 180.

Descriptors: (*Air pollution, Stereomapping), (*Computer systems hardware, Design), Graphic methods, Data processing, Computer programming, Maps, Atmospheric composition, Interpolation.
Identifiers: Air quality data, *Computer mapping techniques, *Computer graphics, SYMAP computer program.

The report presents an evaluation of computer equipment and programs for graphic display. It is divided into three sections; computing machinery (hardware), computer programs (software) and types of maps, and data for graphic display. In addition, the introduction discusses the criteria for computer mapping, principles of operation, and current and future applications. (Author)

PB-204 738
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Oceanography.
CHLORINATED HYDROCARBONS IN THE MARINE ENVIRONMENT.

1971, 47p* W71-11472, EPA-WQO-16070-00/71

Descriptors: (*Water pollution, *Insecticides), (*Chlorine organic compounds, Water pollution), (*Oceans, Water pollution), Recommendations, DDT, Ecology, Biphenyl, Ocean currents, Fishes, Birds, Marine biology.
Identifiers: Biphenyl/chloro.

The report discusses the fact that the oceans are the ultimate accumulation site for the persistent chlorinated hydrocarbons. The report presents material to support its recommendations: A massive effort should be made immediately to check the escape of persistent toxicants into the environment; Rates of entry of each pollutant into the marine environment be determined; and The laws relating to the registration of chemical substances and the release of production figures by the government be examined.

PB-204 740
Pacific Northwest Water Lab., Corvallis, Oreg.
THE 50-MILE BALLAST-OIL DUMPING PROHIBITED ZONE OFF ALASKA, RECONSIDERED IN THE LIGHT OF AVAILABLE DATA GLEANED FROM SIGNIFICANT INCIDENTS,
M. H. Feldman. Oct 70, 25p Working Paper-77
W71-11796, EPA-WQO-16070-10/70

Descriptors: (*Ballast, *Waste disposal), (*Water pollution, Oils), (*Ocean currents, Water pollution), (*Alaska Gulf, Water pollution), Coasts, Birds, Dispersants, Surfactants, Ships, Aquatic animals, Marine biology, Pacific Ocean.
Identifiers: *Oil pollution, Water pollution effects (Animals), Water pollution effects (Plants).

The 50-mile ballast dumping prohibited zone is discussed under the following sections: Simplified statements of biological and chemical knowledge and understanding of petroleum pollution in the Alaskan environment based on what may be considered as having been learned, or at least inferred, from observation and experience in spill areas combined with such scientific data as were available; Abbreviated statements of information deficiencies for analysis of the Alaskan situation; and Discussion of the 50-mile prohibited zone. (Author)

PB-204 817
Utah State Univ., Logan.
CHARACTERISTICS AND POLLUTION PROBLEMS OF IRRIGATION RETURN FLOW.

May 69, 250p W72-01984, EPA-WQO-13030-05/69
Contract DI-14-12-408
Prepared in cooperation with Robert S. Kerr Water Research Center, Ada, Oklahoma.

Descriptors: (*Water pollution, *Surface waters), (*Irrigation, Water pollution), Reviews, Ground water, Water quality, Nutrients, Soil chemistry, Law (Jurisprudence), Salinity, Sources, Stream pollution, Rivers, Sediments, Pesticides, Water resources.
Identifiers: Irrigation return water.

An extensive review of the literature was made to assess the present state of scientific knowledge and technology regarding water pollution problems associated with the practice of irrigation and occurring in irrigation return flow. The effect of irrigation on the subsequent reuse of water by other users was considered. Feasibility studies have been conducted on treating and disposing of return water. A need was found for economic research explicitly concerned with irrigation return flow. The legal aspects of reuse and water

quality of irrigation return flows were examined and the recommendation made for more intensive study of the inseparable nature of quality-quantity management in relation to institutional, economic, and legal restrictions. The article contains 245 references and a separate bibliography of 700 entries.

PB-204 818
Kansas Univ., Lawrence. Dept. of Civil Engineering.
POLLUTION IMPLICATIONS OF ANIMAL WASTES. A FORWARD ORIENTED REVIEW,
Raymond C. Loehr. Jul 68, 188p W72-01985, EPA-WQO-13040-07/68
Contract FWPCA-14-12-28
Prepared in cooperation with Robert S. Kerr Water Research Center, Ada, Oklahoma.

Descriptors: (*Water pollution, *Agricultural wastes), (*Livestock, Agricultural wastes), Reviews, Beef cattle, Poultry, Swine, Recommendations, Trends, Public health, Ground water, Rivers, Waste disposal, Sewage treatment, Fertilizers, Incinerators, Cost estimates.
Identifiers: Manure, *Feedlot wastes, *Solid waste disposal, Water pollution control.

The purpose of the review is to present a forward oriented state-of-the-art of pollutional implications which must be faced with the ever increasing trend toward confinement feeding large numbers of livestock. The manure wastes from all varieties of livestock under feed in the United States are characterized and related both to human population equivalents and beef cattle equivalents. The potential environmental hazards which may result from improper handling, storage, and disposal of these wastes were discussed. The effectiveness and economics of various conventional wastes treatment and disposal methods as related to confinement feeding wastes were evaluated.

PB-204 820
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
DESIGN AND OPERATION OF AN INFORMATION CENTER ON ANALYTICAL METHODOLOGY.
Water pollution control research series.

Jun 71, 128p W72-01994, EPA-WQO-16020-FSO-06/71
Contract FWPCA-14-12-862
Paper copy available from GPO $1.25 as EP2.10:16020-FSO-06/71.

Descriptors: (*Information centers, *Water analysis), (*Water resources, Information centers), Water pollution, Design criteria, Operations, Information retrieval, Subject indexing, Information systems.
Identifiers: Analytical Methodology Information Center.

The report discusses the design and operation of a pilot analytical methodology information storage and retrieval system tailored to the needs of the Analytical Quality Control Laboratory (AQCL) and other segments of the National Analytical Methods Development Research Program (NAMDRP). All aspects of the system are presented.

PB-204 861
Engineering-Science, Inc., Washington, D.C.
EXHAUST GASES FROM COMBUSTION AND INDUSTRIAL PROCESSES.
Final rept.

2 Oct 71, 440p* APTD-0805
Contract EPA-EHSD-71-36

Descriptors: (*Air pollution, *Flue gases), Sources, Combustion products, Industrial wastes, Gas flow, Temperature, Chimneys, Coal, Fuel oil, Electric power plants, Incinerators, Chemical industry, Food industry, Metal industry, Petroleum industry, Paper industry, Solvents, Gasoline, Minerals.
Identifiers: *Implementation Air Pollution Planning Program.

A report is presented of a project which proposed to assemble information on exhaust gas flow rates from selected air pollution sources. The objectives of the project were: To determine the extent to which operating variables and process through put rates affect exhaust gas conditions and emission rates, and To recommend exhaust gas conversion factors to be used in the development of implementation plans for air quality control regions. The scope of the project required conversion factors to be developed for 76 major combustion and industrial processes. For each source category, four parameters were evaluated: gas flow rate, gas temperature, gas velocity, and stack height.

PB-204 863
TRW Systems Group, Redondo beach, Calif.
CHEMICAL REMOVAL OF NITROGEN AND ORGANIC SULFUR FROM COAL.
Final rept.,
R. A. Meyers, J. S. Land, and C. A. Flegal. 14 May 71, 62p* 17270-6007-RO00 APTD-0845
Contract EPA-EHSD-71-7

Descriptors: (*Coal preparation, Solvent extraction), (*Desulfurization, Coal), Nitrogen organic compounds, Sulfur organic compounds, Organic acids, Nitrobenzenes.
Identifiers: Air pollution control, *Denitrification.

Techniques for extracting organic sulfur and nitrogen compounds from coal without significantly altering the remainder of the coal matrix were tested in the laboratory. The concept for chemical removal of organic sulfur and nitrogen is feasible. Weak organic acids remove 45-80% of the organic sulfur from the coals investigated depending on process conditions and the specific coal leached. Nitrobenzene appears to be the most efficient solvent for the removal of organic sulfur. Aqueous caustic removes small amounts of organic sulfur from some coals, but none from others. Particle size (-200 mesh to 1/2-inch) has no discernable effect on the removal of organic sulfur by nitrobenzene. The leaching solvent, nitrobenzene, may be recycled at least three times to remove organic sulfur from coal. Weak organic acids and strong inorganic acids appear to remove nitrogen from the coals tested in this program according to the Dumas analytical method, but no nitrogen is removed according to the Kjeldahl method. Weak organic acids for removal of organic sulfur from coal may be readily adapted to engineering process schemes. The cost of the process for removal of organic sulfur from coal is highly dependent on the degree of solvent loss, and the ability to recycle solvent and allow high sulfur compound buildup. The process cost for removal or organic sulfur is approximately $1.00-$1.50/ton of coal. (Author)

PB-204 868
Pacific Northwest Water Lab., Corvallis, Oreg.
THE BARGED OCEAN DISPOSAL OF WASTES. A REVIEW OF CURRENT PRACTICE AND METHODS OF EVALUATION,
B. D. Clark, W. F. Rittall, D. J. Baumgartner, and K. V. Byram. Jul 71, 125p* W72-01987, EPA-WQO-16070-FGY-07/71

Descriptors: (*Waste disposal, *Oceans), (*Water pollution, Waste disposal), (*Barges, Waste disposal), Economic analysis, Refuse disposal, Environmental surveys, Ocean currents, Ocean bottom, Mathematical models, Containers, Spoil, Sludge disposal, Industrial wastes, Radioactive wastes, Cost estimates.
Identifiers: *Solid waste disposal.

A broad scope examination was made of barged ocean disposal of liquid and solid wastes. Basic discussions include: The physical characteristics of various selected wastes; Economics as a function of haul distance; Reported effects of past discharge operations; and The relative importance of environmental factors such as density and current profiles. The major emphasis of the report centers on physical fate prediction methods and describes the physical transport in four separate steps: convective descent, collapse, long term dispersion, and bottom transport or resuspension. An existing mathematical model developed by Koh and Fan is used and demonstrates the complex nature of some of the more obvious parameters. (Author)

PB-204 869
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
ANALYSIS OF AIRCRAFT EXHAUST EMISSION MEASUREMENTS: STATISTICS.
Technical rept.

19 Nov 71, 182p CAL-NA-5007-K-2 APTD-0848
Contract EPA-68-04-0040

Descriptors: (*Aircraft, *Exhaust gases), (*Air pollution, Exhaust gases), Gas sampling, Statistical analysis, Data analysis, Spark ignition engines, Gas turbine engines, Jet engines.
Identifiers: *Aircraft exhaust.

Descriptive accounts are presented of statistical procedures which were applied to the analysis of mass emissions data as determined from aircraft exhaust emissions measurements. Results of these analyses are discussed, with an emphasis on the significance of the results within the context of the data base available. In essence, the purpose of the report is to isolate the causes or sources of both fixed and random contributions to the variability observed in the data and to estimate, wherever possible, the magnitudes of these contributions. Specific questions of broad interest are addressed and statistical inferences drawn with respect to these questions. (Author)

PB-204 870
Voorhees (Alan M.) and Associates, Inc., McLean, Va.
A GUIDE FOR REDUCING AUTOMOTIVE AIR POLLUTION.

Nov 71, 81p* APTD-0837
Contract EPA-CPA-70-100
Prepared in cooperation with Ryckman, Edgerley, Tomlinson and Associates, St. Louis, Mo.

Descriptors: (*Air pollution, Exhaust gases), (*Highway transportation, *Exhaust gases), (*Vehicular traffic control, Air pollution), Urban planning, Regulations, Traffic engineering, Taxes, Parking facilities.
Identifiers: *Automobile exhaust, Air pollution control.

A guide is presented which is designed to aid transportation professionals and state air pollution control agencies in selecting transportation controls suggested in the regulations pursuant to the Clean Air Act of 1970. Actions considered here emphasize the reduction of traffic volume and congestion and can be implemented within five years. The guide outlines the laws and regulations that require assessment of the air pollution impact of transportation. It then discusses the following techniques for improving traffic flow: freeways, arterials, and downtown distribution. Also discussed are techniques for reducing the concentration of pollution and for reducing auto traffic.

PB-204 876
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
BACKGROUND INFORMATION-PROPOSED NATIONAL EMISSION STANDARDS FOR

HAZARDOUS AIR POLLUTANTS: ASBESTOS, BERYLLIUM, MERCURY.

Dec 71, 30p* APTD-0753

Descriptors: (*Air pollution, Standards), (*Mercury, Air pollution), (*Asbestos, Air pollution), (*Beryllium, Air pollution), Public health, Asbestosis, Beryllosis, Industrial wastes, Economic analysis, Air pollution control equipment.
Identifiers: *Air pollution standards, Air pollution effects (Animals).

For asbestos, beryllium, and mercury, proposed national air pollution standards are summarized. Reviews are presented for the following: The effects on health; the The nature of the problem; The development of the proposed standard; and, its economic impact. A report on atmospheric dispersion estimates is appended. (Author)

PB-204 877
Monsanto Research Corp., Dayton, Ohio. Dayton, Lab.
INSTRUMENTATION FOR THE DETERMINATION OF NITROGEN OXIDES CONTENT OF STATIONARY SOURCE EMISSIONS. VOLUME I,
Leo P. Parts, Paul L. Sherman, and Arthur D. Snyder. Oct 71, 75p* MRC-DA-307 APTD-0847
Contract EPA-EHSD-71-30

Descriptors: (*Air pollution, Nitrogen oxides), (*Gas detectors, *Nitrogen oxides), (*Flue gases, Air pollution), Reviews, Monitors, Performance evaluation, Cost estimates, Infrared spectroscopy, Ultraviolet spectroscopy, Potentiometric analysis, Chemiluminescence, Gas chromatography, Raman spectroscopy, Mass spectroscopy, Light scattering.
Identifiers: *Air pollution detection, Laser spectroscopy, Photoionization.

Information regarding the state-of-the-art of NO (x) (x = 1 to 2) monitoring instrumentation has been assembled and evaluated. The evaluation was based on the present and projected requirements in stationary source emissions monitoring, the operational characteristics and performance capabilities of the instruments, and on the cost/performance criteria. Commercially available and prototype instruments, and laboratory-stage instrumental methods are covered. Instruments based upon wet chemical methods were excluded. The design and operational features of seven instruments which are undergoing laboratory and on-site evaluation at a fossil fuel burning installation are described. Sixteen other NO (x) analysis concepts were also evaluated. Chemiluminescence, correlation spectrometry, mass spectrometry and selective photoionization have been identified as the preferred analysis methods upon which new NO (x) emissions monitoring instruments can be based, using currently available technology, to meet the performance requirements. Novel and potentially useful monitoring techniques, based on the evolving laser technology, were identified.

PB-204 878
Northern Research and Engineering Corp., Cambridge, Mass.
ASSESSMENT OF AIRCRAFT EMISSION CONTROL TECHNOLOGY,
E. K. Bastress, R. C. Baker, C. F. Robertson, R. D. Siegel, and G. E. Smith. Sep 71, 206p* NREC-1168-1 APTD-0850
Contract EPA-68-04-0011

Descriptors: (*Air pollution, Exhaust gases), (*Aircraft engines, *Exhaust gases), (*Air pollution control equipment, Aircraft engines), Standards, Jet engines, Spark ignition engines, Aviation fuels, Monitors, Efficiency, Gas detectors, Cost effectiveness, Nitrogen oxides, Sulfur dioxide, Hydrocarbons, Particles, Odor control, Smoke abatement, Terminal air traffic control.
Identifiers: *Aircraft exhaust.

The results are presented of an investigation which was aimed at providing information for establishing standards on emissions from aircraft activities. The program consisted of independent investigation of the following topics: Emission control by engine modification; Emission control by ground operations modification; Emission control by fuel modification; and Emission measurement. Engine modification control methods were identified through reviews of earlier work and through discussions with engine manufacturers. A list of specific control methods was formulated on the basis of preliminary analyses in which feasibility was indicated. The preliminary list of control methods was then subjected to more detailed analysis of control effectiveness and implementation costs. Ground operations modification control methods were evaluated in a similar manner.

PB-204 879
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
ANALYSIS OF AIRCRAFT EXHAUST EMISSION MEASUREMENTS.
Technical rept. Jun-Sep 71,
Leonard Bogdan, and H. T. McAdams. 15 Oct 71, 643p CAL-NA-5007-K-1 APTD-0851
Contract EPA-68-04-0040

Descriptors: (*Air pollution, *Exhaust gases), (*Aircraft engines, Exhaust gases), Data processing, Standards, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Take off, Landing, Taxiing, Jet engines, Spark ignition engines, Turboprop engines, Editing routines.
Identifiers: Air pollution standards, *Aircraft exhaust.

An account is presented of the analytical procedures and data processing techniques employed in translating field-measurement data of aircraft exhaust emissions into a form consistent with the needs for the promulgation of realistic standards. Pollutant mass emissions for carbon monoxide (CO) hydrocarbons (HC) and the oxides of nitrogen (NO (x)) are computed for an aircraft operational cycle comprised of the following modes: taxi/idle, take-off, climb out and approach. The calculations are for specific engine power (or thrust) settings for each mode as well as for specified times in mode. Numerical results are tabulated for each individual engine tested together with summaries obtained by aggregating engine data on a model basis. Data are presented for turboprop/turbine engines, light-utility piston engines and auxiliary power units. (Author)

PB-204 885
Eastern Environmental Radiation Lab., Montgomery, Ala.
ANNUAL REPORT OF THE EASTERN ENVIRONMENTAL RADIATION LABORATORY. JANUARY-DECEMBER 1970.

Oct 71, 78p EERL-71-4

Descriptors: (*Radiation, *Environmental surveys), (*Radiobiology, *Ecology), Monitors, Radiochemistry, Radiation effects, Microwaves, Instruments, Dosimetry, Cytology, Genetics, Health physics, Public health.
Identifiers: *Microwave radiobiology.

The publication describes the activities of the Eastern Environmental Radiation Laboratory for calendar year 1970. Through research, applied technology and training the Laboratory fulfills its responsibility for carrying out a national program for measuring population exposure to ionizing and nonionizing radiation and for assessing the radiological quality of the environment. Its endeavors include the development of analytical and radiochemical methodology nuclear facility surveillance technology, and biological effects of ionizing and nonionizing radiation.

PB-204 920
AiResearch Mfg. Co. of Arizona, Phoenix.
EXHAUST EMISSIONS TEST AIRESEARCH AIRCRAFT PROPULSION AND AUXILIARY POWER GAS TURBINE ENGINES.
Test rept.

10 Sep 71, 420p GT-8747-R APTD-0849

Descriptors: (*Air pollution, Exhaust gases), (*Gas turbine engines, *Exhaust gases), (*Aircraft engines, Exhaust gases), Monitors, Standards, Hydrocarbons, Carbon monoxide, Carbon dioxide, Nitrogen oxides, Gas turbine power generation, Auxiliary power plants, Gas detectors, Jet engines.
Identifiers: *Aircraft exhaust, Air pollution standards.

The report describes the test setup, procedure, and analysis of exhaust emissions measurement conducted on 32 commercial gas turbine engines comprised of both on-board aircraft auxiliary power and aircraft propulsion production, overhaul, and development units. The units selected are currently active in commercial airline service and thus contribute to aircraft related pollution levels. The purpose of this test was to measure exhaust emissions from auxiliary power and small aircraft propulsion gas turbines engines to establish base levels of unburned hydrocarbons, carbon monoxide, carbon dioxide and oxides of nitrogen in current existing engine designs. In addition, a survey of engine duty cycles as related to normal customer operation in the field was made to determine a typical duty cycle and the corresponding estimated level of exhaust emissions produced. (Author)

PB-204 922
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
RECOVERY AND UTILIZATION OF MUNICIPAL SOLID WASTE. A SUMMARY OF AVAILABLE COST AND PERFORMANCE CHARACTERISTICS OF UNIT PROCESSES AND SYSTEMS,
N. L. Drobny, H. E. Hull, and R. F. Testin. 1971, 66p EPA-SW-10c-71
Contract PH-86-67-265
Library of Congress Catalog card no. 70-611464.

Descriptors: (*Waste disposal, *Materials recovery), Utilization, Refuse disposal, Feasibility, Performance evaluation, Cost estimates, Material separation, Separators, Magnetic separators, Comminution, Vibrating screens, Flotation machines, Jigs (Concentrators), Fluidized bed processors, Incinerators, Composts, Heat recovery, Pyrolysis, Cans, Paper, Glass, Rubber, Protein, Food.
Identifiers: *Waste recycling, *Solid waste disposal, Food supplements.

The report compiles available cost and performance characteristics of processes that are, or might be, employed in solid waste recovery and utilization. The information was obtained from operators of existing systems, equipment manufacturers, and selected experts and the study is focused on size reduction, separation, and recovery and utilization. Among the conclusions, it was found that more than two-thirds of size reduction equipment is used primarily on uniform material in industry and is not recommended for direct use on municipal solid waste; with the exception of magnetic separation, the degree to which the separation techniques studied can be adopted in practice is not well established because of the lack of suitable cost and performance data upon which to base evaluations; in the area of recovery and utilization of mixed solid waste, byproduct recovery appears to have greater economic potential than does material salvage.

PB-204 930
Bureau of Radiological Health, Rockville, Md. Div. Medical Radiation Exposure.

DESIGN AND EVALUATION OF AN ELECTRONIC RADIOGRAPHY SYSTEM,
William B. Miller, Jr., Virgil D. Baker, III, Heinz S. Weens, James H. Larose, and Richard S. Colvin. Oct 71, 80p BRH/DMRE-72-3 FDA-72-8014
Contract PH-86-66-153
Paper copy available from GPO $0.75 as HE20.4112:72-3.

Descriptors: (*Fluoroscopes, *Television display systems), (*Radiation dosage, *Fluoroscopy), Radiography, Video signals, Magnetic recording, Magnetic disks, Image tubes, Storage tubes, Magnetic storage, Digital systems.

The report describes the development and evaluation of a low-exposure electronic radiography system with these major features: (1) reduction in x-ray photon requirements by a factor of approximately 100 in comparison with the usual high speed film-screen combination; (2) instant x-ray imaging and storage for immediate diagnosis, using an exposure time of approximately 1/60 second; and (3) adaptability to the usual televised x-ray image intensifier system. (Author)

PB-204 989
Little (Arthur D.), Inc., Cambridge, Mass.
EVALUATION OF COMMUNITY ODOR EXPOSURE,
David A. Kendall, and Thomas Lindvall. 29 Apr 71, 38p APTD-0846
Contract CPA-70-67

Descriptors: (*Odors, Environmental surveys), (*Air pollution, Odors), (*Public opinion, Odors), Odor detection, Sociometrics, Sources, Industrial wastes, Exhaust gases.

A symposium was held to deal particularly with the evaluation of the effects of odorous exposure in the community, as well as to review recent studies of dose, response, and dose response relationships. The report of the proceedings includes the following topics: Human reactions to odors; Data on adverse human reactions to odor; Empirical data on odor exposure from different sources; Sensory analysis; Dose-response relationships; Interaction between odor sources and other environmental conditions; Temporal patterns.

PB-204 990
Meteorology Research, Inc., Altadena, Calif.
PARTICULATE EMISSIONS, PLUME RISE, AND DIFFUSION FROM A TALL STACK. VOLUME 1, TECHNICAL REPORT.
Final rept.,
Brand L. Niemann, Margaret C. Day, and Paul B. MacCready, Jr. Jan 70, 141p MRI-69-FR-890 APTD-0852
Contract CPA-22-69-20

Descriptors: (*Atmospheric motion, *Plumes), (*Electric power plants, Air pollution), (*Air pollution, Particles), Turbulence, Atmospheric diffusion, Plume detection, Combustion products, Impactors, Chimneys, Airborne detectors, Wind (Meteorology), Particle size, Pennsylvania.
Identifiers: Keystone Generating Station, LAPPES (Large Power Plant Effluent Study).

An experiment was undertaken to make airborne measurements of the environment and of plume characteristics. The special measurements were those of turbulence, taken with a Universal Indicated Turbulence System, and particles collected with a Moving Slide Impactor. Sequential photographs were made of the plume from a camera on the ground. The report describes the data reduction techniques, and presents samples of the data. Also contained is a brief evaluation of much of the data.

PB-205 800
Karolinska Institutet, Stockholm (Sweden). Dept. of Environmental Hygiene.
MERCURY IN THE ENVIRONMENT. A TOXICOLOGICAL AND EPIDEMIOLOGICAL APPRAISAL,
Lars Friberg, Gosta Lindstedt, Gunnar Nordberg, Claes Ramel, and Staffan Skerfving. Nov 71, 551p* APTD-0838
Contract CPA-70-30

Descriptors: (*Toxicology, *Mercury), (*Air pollution, Mercury), (*Water pollution, Mercury), (*Epidemiology, Mercury), Reviews, Chemical analysis, Mercury organic compounds, Mercury inorganic compounds, Mercury poisoning, Environmental surveys, Signs and symptoms, Metabolism, Absorption (Biology), Heavy metal excretion, Excretion, Humans, Animals, Fishes, Exposure, Genetics, Sweden.
Identifiers: Mercury/methyl, Air pollution effects (Animals), Water pollution effects (Animals).

A review of the toxicity of mercury is presented. The report which was based on a literature survey, presents basic information on the toxic action of mercury and on quantitative information in regard to the relation between dose and effects on human beings and animals. The report presents: Methods of analysis of mercury in the air, and in biological material; Transport and transformation of mercury in nature and possible routes of exposure; Metabolism; Symptoms and signs of intoxication; Normal concentrations of mercury in biological material; Inorganic mercury-relation between exposure and effects; Organic mercury compounds-relation between exposure and effects; and genetic effects of mercury.

PB-205 001
Northeastern Univ., Boston, Mass. Dept. of Chemistry.
COLLOID FLOTATION AND ADSORBING COLLOID FLOTATION,
Barry L. Karger. Dec 70, 83p W72-02105, EPA-WQO-17010-DBL-12/70

Descriptors: (*Ion exchange resins, *Coagulants), (*Flotation, *Chemical removal (Waster treatment)), (*Industrial waste treatment, Flotation), (*Clays, Chemical removal (Water treatment)), (*Chromium, Chemical removal (Water treatment)), Colloids, Separation, Zeta potential, Adsorbents, Ion exchanging, Clarification, Fluidized bed processors, Manganese oxides.
Identifiers: *Foam flotation, *Water pollution control.

The clean-up of waste waters in municipal water supplies is ultimately a separation problem involving the removal of pollutants. Thus there is continual interest in finding new separation methods for potential use in this application. The reported research explored the applicability of three separation processes to water pollution control: Colloid flotation for removal of clay materials; Coagulated ion exchange resin for removal of electrolyte; and Adsorbing colloid flotation for removal of electrolyte again. The report details each of these studies separately. Some of the important factors controlling separation for each method are described and potential applications to waste water treatment field are presented and suggested. (Author)

PB-205 179
TRW Systems Group, McLean, Va. Washington Operations.
PROPOSED AIR QUALITY SURVEILLANCE SYSTEM FOR THE STATE OF ALABAMA.

Nov 71, 102p* 18425.008 APTD-0874
Contract EPA-68-02-0048

Descriptors: (*Air pollution, *Alabama), Sources, Inventories, Tables (Data), Data aquisition, Particles, Sulfur dioxide, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Monitors, Demography.
Identifiers: *Implementation Air Pollution Planning Program, Air Quality Control regions, *Air quality data.

The report presents air pollution data for Alabama as part of its air pollution implementation planning program. The specifics of regional classification of air quality are discussed and summarized in tabular form. The location of sampling sites in the area of estimated maximum pollutant concentrations are noted. A timetable for acquisition of needed equipment is presented as is tabulation of required and existing air quality surveillance equipment. The sample collection and analysis, and data handling is discussed. Pertinent air quality data collected in State of Alabama are tabulated and presented.

PB-205 187
Massachusetts Inst. of Tech., Cambridge. Dept. of Electrical Engineering.
CHARGED DROPLET TECHNOLOGY FOR REMOVAL OF PARTICULATES FROM INDUSTRIAL GASES.
Final rept., Task no. 8,
J. R. Melcher, and K. S. Sachar. 1 Aug 71, 125p* APTD-0868
Contract EAP-68-002-0018

Descriptors: (*Particles, Separation), (*Air pollution, Particles), (*Industrial waste treatment, *Dust control), Drops (Liquids), Electrostatic precipitation, Scrubbers, Electric fields, Charged particles, Electric charge, Theories.
Identifiers: *Air pollution control.

A report is presented which deals with collection of particles on drops using electric fields. The first objective of the project was a review of what has been reported through patents and in formal literature relating to the use of drops and electric fields in particulate control. Also presented is a survey which classifies the devices according to the type of interaction between drops and particles. A sketch of fundamental models appropriate to each class of interaction is given. Also reported is an assessment of needed research and an identification of promising types of devices. (Author)

PB-205 188
Massachusetts Dept. of Tech., Cambridge. Dept. of Electrical Engineering.
ELECTRICAL INDUCTION OF PARTICULATE AGGLOMERATION.
Final rept., on Task 7,
J. R. Melcher, and K. S. Sachar. 10 Aug 71, 64p* APTD-0869
Contract EPA-68-002-018

Descriptors: (*Particles, *Agglomeration), (*Dust control, *Air pollution control equipment), (*Electrostatic precipitation, Agglomeration), Electric fields, Particle size, Feasibility, Applications of mathematics, Gas flow.

The report presents results dealing with the role of electric fields in agglomeration processes. The objectives relate to agglomeration characterized as follows: The gas-entrained particulate includes particles of both signs, so that charge neutrality on the macroscale is preserved; Two families of particle sizes are used. It is agglomeration between fine particulate and large particles that is of interest through the microfields existing between these particles. The objectives were to provide theoretical estimates of the feasibility of using the agglomeration process described above, in a practical conditioning device; to glean what evidence there is from the literature that such agglomerative interactions occur; to make preliminary experimental tests to demonstrate the type of agglomeration of interest.

PB-205 189
TRW Systems Group, Redondo Beach, Calif.
DEVELOPMENT OF LASER INSTRUMENTATION FOR PARTICLE MEASUREMENT.
Final rept.,
B. J. Matthews, and R. F. Kemp. Jun 71, 72p TRW-14103-6003-RO00 APTD-0870
Contract CPA-70-4
See also PB-196 499.

Descriptors: (*Holography, *Flow distribution), (*Boilers, Flow distribution), (*Adsorbents, *Limestone), (*Air pollution, Holography), Particles, Surfaces, Sulfur dioxide, Injection, Feasibility, Ruby lasers, Distribution (Property), Resolution, Light scattering, Backscattering, Electron microscopy.
Identifiers: *Air pollution control.

The report summarizes recent developments in laser-illuminated instrumentation for measuring particulate density distributions in an operating coal-fired steam boiler. The work is a continuation of a previous effort which was concerned with applying single beam (Gabor) pulsed ruby laser holography to the recording of particulates over extreme distances. The present work attempts to determine if limestone dust in the presence of flyash background could be recorded holographically via back or side scattering of a ruby laser beam. To investigate the feasibility of making holograms of side or back scattering of a ruby laser beam, a mathematical model was first derived. This model related 4 factors which gives the transmittance along the scattering path from the laser to a detector and allows analysis of experimental measurements.

PB-205 205
American Enka Co., Enka, N.C. Central Engineering Dept.
ZINC PRECIPITATION AND RECOVERY FROM VISCOSE RAYON WASTE WATER.
Water Pollution Control Research series,
David M. Rock, and Grady Allman. Jan 71, 88p W72-02364, EPA-WQO-12090-ESG-01/71
Paper copy available from GPO $1.00 as EP2.10:12090ESG-01/71.

Descriptors: (*Zinc sulfates, *Chemical removal (Water treatment)), (*Textile industry, Industrial waste treatment), (*Industrial waste treatment, Zinc sulfates), (*Materials recovery, Zinc sulfates), Materials recovery, Spinning (Staple fibers), Textile processes, Precipitation (Chemistry), Pilot plants, Neutralizing, Sludge, Cost estimates, Operating costs, Utilization, Rayon.
Identifiers: *Water pollution control, Zinc hydroxides.

A zinc recovery system was developed to recover zinc from dilute zinc sulfate lost both when acid spun yarns are washed and at various stages in the spinning process. The process included neutralization of the waste stream to pH 6.0, sedimentation of insolubles, crystallization of zinc hydroxide in a high pH environment, sedimentation of zinc hydroxide and solubilization of the zinc with sulfuric acid. A pilot plant was constructed and operated. It obtained 98-99% removal efficiency. The zinc hydroxide sludge was easily concentrated. Operating and maintenance costs were estimated. Recovery and sale of 2000 lbs of zinc daily assures recovery of these costs.

PB-205 206
Dallas City, Oreg.
COMBINED TREATMENT OF DOMESTIC AND INDUSTRIAL WASTES BY ACTIVATED SLUDGE.
Water Pollution Control Research series.

May 71, 119p W72-02365, EPA-WQO-12130-EZR-05/71
Paper copy available from GPO $1.25 as EP2.10:12130-EZR-05/71.

Descriptors: (*Activated sludge process, *Sewage treatment), (*Industrial waste treatment, Activated sludge process), Aerobic processes, Canneries, Performance evaluation, Capital costs, Operating costs, Cost estimates, Design criteria, Oregon.
Identifiers: *Secondary sewage treatment, Dallas (Oregon).

A completely aerobic secondary treatment facility was constructed to treat both domestic wastes from City of Dallas, Oregon, and cannery wastes in season as well. The system was designed for 2.0 mgd average daily flow and a BOD loading of 7000 lbs/day. Results indicated that: Start-up, operation, and shut-down of the cannery caused no operational problems; The treatment system was sufficiently flexible and stable to withstand shock organic and hydraulic loadings; and A good quality effluent was produced with aeration times varying from 4 to 60 hours. The costs are also given.

PB-205 207
National Oil Recovery Corp., Bayonne, N.J.
CONVERSION OF CRANKCASE WASTE OIL INTO USEFUL PRODUCTS.
Water Pollution Control Research series,
Solfred Maizus, and Kenneth Urquhart. Mar 71, 84p W72-02366, EPA-WQO-15080-DBO-03/71
Paper copy available from GPO $1.00 as EP2.10:15080DBO-03/71.

Descriptors: (*Lubricating oils, Reprocessing), (*Waste disposal, Materials recovery), (*Materials recovery, Lubricating oils), Vacuum distillation, Refining, Lubricant additives, Diesel fuels, Metals, Cost estimates, Chemical engineering.
Identifiers: *Waste recycling, Liquid waste disposal.

A simplified technique for reprocessing spent automotive crankcase oils into useful petroleum products other than lube oils, without producing residues which cause water pollution was demonstrated. All of the petroleum products from vacuum distillation of the waste oils were sold as low sulfur heating fuel as potential diesel fuels. Only the water in the fuel was not recovered. Varying composition of the waste oils accounted for much of the operation difficulty encountered. Metal based additives caused numerous clogging problems. Feed variability plus increasingly stringent effluent laws resulted in obsolescence of the plant before test runs were finished. Use of the waste oils in the plant was extremely damaging to the equipment, resulting in much greater yearly depreciation than was anticipated.

PB-205 208
Atlantic Research Systems Div., Costa Mesa, Calif. Marine Systems.
RECOVERY OF FLOATING OIL ROTATING DISK TYPE SKIMMER.
Water Pollution Control Research series.

Jul 71, 136p W72-02367, EPA-WQO-15080-FWN-07/71
Contract EPA-WQO-14-12-883
Paper copy available from GPO $1.25 as EP2.10:15080-FWN-07/71.

Descriptors: (*Water pollution, Oils), (*Oils, *Skimmers), (*Materials recovery, Oils), Disks (Shapes), Tests, Fuel oil, Bunker oils, Performance evaluation, Theories.
Identifiers: *Oil pollution removal.

Laboratory tests indicated the feasibility of recovering 50,000 gal. of oil per hour using a series of powdered metal discs approximately 7 ft. in diameter and 12 ft. long. Testing included various oils ranging from light diesel oil to Bunker 'C' grade oil. Oil spread as thinly as 1.5 mm in thickness was amenable to collection, but recovery efficiency greatly improved with increased thickness. Herding of the oil with booms, as well as current, whether natural or caused by towing the disc unit through the oil, were shown to increase the oil thickness. Oil starvation, in the form of insufficient oil contacting the disc was shown to be a significant problem, but recovered oil still contained only around 2% moisture, eliminating the need for a separator. Wave action was shown to actually enhance pick-up.

PB-205 244
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
ALBUQUERQUE, NEW MEXICO METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
David V. Mason. Jun 70, 55p* APTD-08

Descriptors: (*Air pollution, *New Mexico), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Albuquerque (New Mexico), *Bernalillo County (New Mexico).

A summary report is presented of the Albuquerque, New Mexico area air pollutant inventory. The study area consists of one complete county, Bernalillo, and portions of three others, Sandoval, Socorro, and Valencia. The area covers approximately 5,700 square miles and had a 1969 population of 365,000. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes and evaporative fuel losses. Each of these categories was divided into point sources and area sources.

PB-205 245
National Air Pollution Control Administration, Durham, N. C.
MERRIMACK VALLEY METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Alan J. Hoffman. Apr 70, 66p* APTD-0820

Descriptors: (*Air pollution, *New Hampshire), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Combustion products, Exhaust gases, Transportation, Fuels, Industrial wastes, Waste disposal, Demography.
Identifiers: *Air quality data, Merrimack Valley.

A summary report is presented of the Merrimack Valley air pollutant emission inventory. The study area consists of six counties in Southern New Hampshire and 28 cities and towns in northeast Massachusetts. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes and evaporative losses. (Author)

PB-205 246
National Air Pollution Control Administration, Durham, N. C.
MIAMI - FORT LAUDERDALE - WEST PALM BEACH AIR POLLUTANT EMISSION INVENTORY,
Michael J. McGrew. Apr 70, 58p APTD-0821

Descriptors: (*Air pollution, *Florida), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Combustion products, Exhaust gases, Transportation, Fuels, Industrial wastes, Waste disposal, Demography.
Identifiers: *Air quality data, Dade County (Florida), Broward County (Florida), Palm Beach County (Florida), Miami (Florida), West Palm Beach (Florida), Fort Lauderdale (Florida).

A summary of the Miami, Florida air pollution emission inventory is presented. The study area, which was chosen on the basis of the distribution of population and air pollution sources, consists of three counties surrounding the cities of Miami, Ft. Lauderdale, and West Palm Beach. This area had a

1968 population of 2,150,000. A grid coordinate system was used to show the geographical distribution of emissions within counties. The pollutants studied were: sulfur oxides, particulates, carbon monoxide, hydrocarbons and nitrogen oxides. All sources of emissions were classified into the following categories: transportation, stationary fuel combustion, solid waste disposal, industrial processes and evaporative losses.

PB-205 251
TRW Systems Group, McLean, Va. Washington Operations.
PROPOSED EMERGENCY EPISODE PLAN FOR THE STATE OF ALABAMA.

Nov 71, 177p* 18425.008-2 APTD-0872
Contract DI-68-02-0048

Descriptors: (*Air pollution, *Alabama), (*Government policies, Air pollution), Regulations, Public health, Particles, Sulfur dioxide, Carbon monoxide, Nitrogen oxides, Oxidizers, Hydrocarbons, Sources, Planning, Handbooks, Monitors, Warning systems, Abatement, Industrial wastes, State government.
Identifiers: *Air pollution episodes, *Air pollution public emergency limits, *Emergency planning, *Implementation Air Pollution Planning Program.

The objective of the Alabama Emergency Episode Plan is to prevent the occurrence of adverse pollutant levels and is designed for the emergency control of the following pollutants: total suspended particulates; oxides of sulfur, carbon monoxide, oxides of nitrogen, photochemical oxidants, and total hydrocarbons. The plan is viewed as a mechanism for reducing high pollution levels by reducing source emissions in a well-structured manner. It is definitive with regard to sources in existence at the date of promulgation. The plan defines measures to be taken by designated agencies and officials of the State of Alabama and cooperating organizations for protection of the health of persons during air pollution episodes. An episode communications manual is included as an appendix to this plan. (Author)

PB-205 252
TRW Systems Group, McLean, Va. Washington Operations.
PROPOSED CONTROL STRATEGY FOR THE STATE OF ALABAMA.

Nov 71, 133p* 18425.008-1 APTD-0871
Contract DI-68-02-0048

Descriptors: (*Air pollution, *Alabama), (*Government policies, Air pollution), Regulations, Planning, State government, Abatement, Sulfur oxides, Particles, Carbon monoxide, Nitrogen oxides, Hydrocarbons, Oxidizers, Strategy, Inventories, Sources, Standards.
Identifiers: Air pollution control, *Implementation Air Pollution Planning Program, *Air pollution standards.

The Clean Air Act requires each state government to implement requirements for the prevention, abatement, and control of sulfur oxides, particulate matter, carbon monoxide, nitrogen oxides, hydrocarbons, and photochemical oxidants. The pollutants to be controlled by the proposed control strategy are divided into two sets, Set 1 consisting of particulate matter and sulfur oxides and Set 2 consisting of carbon monoxide, nitrogen oxides, hydrocarbons, and photochemical oxidants. The report fulfills the federal requirements outlined above by presenting the control strategy rules and regulations for the State of Alabama. Also included is the existing (1971) emissions inventory summary for each county in the State. (Author)

PB-205 253
TRW Systems Group, McLean, Va. Washington Operations.
PROPOSED RULES AND REGULATIONS FOR THE STATE OF ALABAMA.

Nov 71, 69p* 18425.008 APTD-0873
Contract DI-68-02-0048

Descriptors: (*Air pollution, *Alabama), (*Government policies, Air pollution), Regulations, State government, Abatement, Law enforcement, Standards, Licenses, Planning, Particles, Carbon monoxide, Sulfur oxides, Nitrogen oxides, Hydrocarbons, Oxidizers, Abatement.
Identifiers: *Air pollution standards, *Implementation Air Pollution Planning Program, Emergency planning, Air pollution control.

The state of Alabama is required under the Clean Air Act to adopt and enforce the national air quality standards for sulfur oxides, particulate matter, carbon monoxide, photochemical oxidants, hydrocarbons and nitrogen dioxide. The proposed Rules and Regulations presented, fulfills these requirements. These rules and regulations provide general measures as well as specific guidelines necessary for the attainment and maintenance of air quality standards for the State of Alabama. The permit system, control regulations, and the episode plan are defined and discussed with their respective rules. (Author)

PB-205 254
Argonne National Lab., Ill. Chemical Engineering Div.
DEVELOPMENT OF HIGH-ENERGY BATTERIES FOR ELECTRIC VEHICLES.
Progress rept. Jul 70-Jun 71,
E. J. Cairns, R. K. Steunenberg, J. P. Ackerman, B. A. Feay, and D. M. Gruen. Jul 71, 98p* APTD-0875

Descriptors: (*Storage batteries, Design criteria), (*Electric vehicles, Storage batteries), Air pollution, Battery electrolytes, Electric automobiles, Lithium, Sulfur, Molten salt electrolytes, Lithium oxides, Aluminates, Aluminum oxides, Fabrication, Tests.
Identifiers: *Lithium sulfur cells, High energy batteries.

The objective of the program described is to develop the technology required to construct secondary batteries having the performance capabilities required for pollution-free electric automobiles. Lithium/sulfur cells using a molten lithium halide-containing electrolyte and operating at 360 to 390 C have achieved capacity densities of up to 0.52 A-hr/sq cm (above 1 V) at a current density of 0.52 A/sq cm. The cell development program is supported by laboratory studies in various areas. The solubility of cathode materials in various electrolytes and the identity of the soluble species are studied. Preliminary results indicate that electrolytes containing only fluoride and chloride anions have the lowest solubility for sulfur-bearing species. A survey of candidate solid electrolytes has led to the investigation of the lithium form of B-alumina. Investigations were made of the corrosion rates of various materials at 375 C, and battery design and performance calculations were carried out for a 1075-lb Li/s battery in a 4300 lb electric automobile. (Author)

PB-205 255
National Air Pollution Control Administration, Raleigh, N. C. Div. of Air Quality and Emission Data.
BATON ROUGE METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Alan J. Hoffman. Jan 70, 29p* APTD-0866

Descriptors: (*Air pollution, *Louisiana), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Baton Rouge (Louisiana), Iberville County (Louisiana), Ascension County (Louisiana), Saint James County (Louisiana).

A summary report is presented of the Batom Rouge, Louisiana area air pollutant emission inventory. The study area consists of five parishes along the river extending up to Baton Rouge from New Orleans. The pollutants, which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year and geographical distribution within the area. The general procedure for estimating the surveys is based on the rapid survey technique for estimating air pollutant emissions. (Author)

PB-205 256
Bendix Aerospace Systems Div., Ann Arbor, Mich.
LONG-PATH SPECTROPHOTOMETRIC INSTRUMENTATION FOR IN-SITU MONITORING OF GASEOUS POLLUTANTS IN THE URBAN ATMOSPHERE.
Final rept.,
Arnold Prostak, and Robert H. Dye. Oct 70, 93p*
BSR-3027 APTD-0889
Contract CPA-22-69-55

Descriptors: (*Infrared spectroscopy, *Gas detectors), (*Air pollution, Gas detectors), (*Ozone, Gas detectors), Spectroscopic analysis, Infrared spectrophotometers, Monitors, Urban areas, Data processing, Sulfur dioxide, Computer programming, Background discrimination, Remote sensing.
Identifiers: *Air pollution detection.

A long-path spectrophotometric instrument is described for the quantitative measurement of ozone and other infrared absorbing gases (such as sulfur dioxide) in unconfined ambient air. A continuous variable filter wheel is used for wavelength selection from 7 to 14 microns. The instrument can be used with an active source at a range from 0.4 to over 1.6 km or it can be used to examine passively the radiant emittance from natural sources. A minicomputer is programmed to control the instrument and analyze the data in real time. The output of spectra or pollutant concentration is on a cathode ray tube, a teletypewriter, and/or punched paper tape. The instrument is sensitive to ozone concentrations ranging from 20 microgram/cu. m. (0.01 ppm) to 2000 microgram/cu. m. (1 ppm), with a measured noise of less than 4 microgram/cu. m. and a time constant of about two minutes. (Author)

PB-205 270
National Air Pollution Control Administration, Durham, N. C.
TRIANGLE METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY (RALEIGH--DURHAM-CHAPEL HILL),
Alan J. Hoffman, and Gabriel Marciante. Aug 70, 79p APTD-0834

Descriptors: (*Air pollution, *North Carolina), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Raleigh (North Carolina), *Durham (North Carolina), *Chapel Hill (North Carolina), *Orange County (North Carolina), *Durham County (North Carolina), *Wake County (North Carolina).

The report presents a summary of a Raleigh-Durham-Chapel Hill, North Carolina air pollution emission inventory. The survey provides estimates of the present magnitude, extent and sources of air pollutant emissions and the status of their control. The following pollutants are considered: sulfur ox-

ides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides. A grid coordinate system was used to show the geographical distributions of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid waste disposal, industrial processes and evaporative losses. (Author)

PB-205 274
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
RENTAL VEHICLE SURVEILLANCE PROGRAM; MARCH 1968 TO JANUARY 1970,
Daniel B. Pinkert, James M. Marzen, and Charles J. Domke. Nov 71, 25p AP-97
Paper copy available from GPO $0.25 as EP4.9:97.

Descriptors: (*Exhaust gases, Surveys), (*Motor vehicles, Exhaust gases), (*Air pollution, Exhaust gases), Test methods, Standards, Carbon monoxide, Hydrocarbons, Gasoline engines, Automobile engines, Statistical data.
Identifiers: Federal exhaust emission standards.

Exhaust-emission tests were performed on rental vehicles representing 26 vehicle types to ascertain the effectiveness of the Federal exhaust emission standards. Most of the rental vehicles tested had odometer readings of less than 15,000 miles, and had received no engine maintenance other than minor carburetor adjustments. Approximately half the cars with odometer readings in excess of 15,000 miles had received one engine tune-up during their fleet operation. All vehicles were tested by the standard Federal seven-mode, seven-cycle cold-start test procedure, and by the New Jersey ACID cycle test and the Clayton Key Mode test. (Author)

PB-205 275
Environmental Protection Agency, Research Triangle, N. C. Office of Air Programs.
GUIDE TO REDUCTION OF SMOKE AND ODOR FROM DIESEL-POWERED VEHICLES.

Sep 71, 30p AP-81
Paper copy available from GPO $0.30 as SN-5503-0028.

Descriptors: (*Air pollution, Exhaust gases), (*Diesel engines, *Exhaust gases), Odors, Particles, Smoke, Handbooks, Trucks, Maintenance, Automotive fuels.
Identifiers: *Diesel engine exhaust, *Air pollution control.

The purpose of the guide is to help reduce the amount of smoke and odor produced by diesel-powered vehicles. The report contains practical information and recommendations that can help in this task. These guidelines are the result of a detailed study of technical literature and reports dealing with diesel smoke and odor and of interviews with engine and vehicle manufacturers, fuel and additive suppliers, fleet operators, and enforcement agencies.

PB-205 276
Vermont State Dept. of Health, Montpelier. Div. of Industrial Hygiene.
CHITTENDEN COUNTY AIR POLLUTANT EMISSION INVENTORY,
Glenn Aiken, and Thomas W. Fitzpatrick. Oct 69, 56p APTD-0839

Descriptors: (*Air pollution, *Vermont), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Chittenden County (Vermont), Burlington (Vermont).

The report is a compilation of air pollutant emissions in the Chittenden County Area, Vermont. The objective of the emission inventory is to determine the quantity of various air pollutants emitted, as well as delineate their geographical variations. The pollutants considered in this survey were: aldehydes, oxides of nitrogen, carbon monoxide, hydrocarbons, organic acids, oxides of sulfur, and particulate matter. Data gathered herein are primarily representative of 1968. The Study Area consists of the Greater Burlington Area and the surrounding towns of Bolton, Charlotte, Colchester, Hinesburg, Huntington, Jericho, Milton, Richmond, Shelburne, St. George, Underhill, Westford, and Williston. (Author)

PB-205 277
Environmental Protection Agency, Research Triangle Park, N. C. Office of Air Programs.
A MATHEMATICAL MODEL FOR RELATING AIR QUALITY MEASUREMENTS TO AIR QUALITY STANDARDS,
Ralph I. Larsen. Nov 71, 61p AP-89
Paper copy available from GPO $0.60 as EP4.9:89.

Descriptors: (*Air pollution, Statistical analysis), (*Atmospheric composition, Statistical analysis), Mathematical models, Statistical distributions, Monitors, Standards, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Oxidizers, Sulfur dioxide, Particles, Tables (Data), Urban areas.
Identifiers: Air quality data, *Air pollution sampling, Air pollution standards.

Analyses of air pollution data indicate that air quality measurements tend to fit a general mathematical model having specific characteristics. These characteristics have been used to develop equations that may be employed to calculate the geometric mean, standard geometric deviation, maximum concentration, and various percentile concentrations of air pollutants. To illustrate the predictive, as well as the interpretive value of the model, parameters have been first calculated for one averaging time from actual data and then calculated for other averaging times by means of the model. Maximum concentrations with the model are compared with measured values for seven gaseous pollutants obtained during continuous sampling for up to 7 years in eight cities. The resulting information can be used in developing implementation plans and emission standards. All the equations needed for performing the calculations are listed.

PB-205 278
National Air Pollution Control Administration, Durham, N. C.
PORTLAND MAINE METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
David V. Mason. Apr 70, 60p APTD-0828

Descriptors: (*Air pollution, *Maine), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Portland (Maine), *Cumberland County (Maine), York County (Maine), Androscogin County (Maine), Sagadahoc County (Maine).

A summary report is presented of the Portland, Maine, air pollutant inventory. The study area consists of four counties surrounding the cities of Portland, Lewiston and Auburn. This area covers approximately 2,600 sq. miles and had a 1969 population of 400,000. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were divided into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes, and evaporative losses. (Author)

PB-205 279
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.
THE FEASIBILITY OF USING COLOR AERIAL PHOTOGRAPHY TO DETECT AND EVALUATE SULPHUR DIOXIDE INJURY TO TIMBER STANDS.
Forest Service research note.
Kristina A. Zealer, Robert C. Heller, Nancy X. Norick, and Marilyn Wilkes. Nov 71, 160p APTD-0865

Descriptors: (*Air pollution, Sulfur dioxide), (*Infrared photography, *Plant diseases), (*Sulfur dioxide, Plant diseases), Color photography, Trees (Plants), Forest land, Airborne detectors, Photointerpretation, Feasibility, Alabama.
Identifiers: *Air pollution effects (Plants).

A feasibility study was undertaken in Alabama near a point source of sulphur dioxide, emissions to determine the best film-filter-scale combination of aerial photography to evaluate SO2 injury to forest vegetation. Normal color film, exposed through a didymium filter, at very large scales (1:800 and 1:1,584) proved to be the most accurate sensor. Color infrared film was almost as good. Interpreter differences were least at large scale and on color film. Ground variables which were best correlated with photo interpretation were: crown color, needle color, Munsell hue, percent of current needles with tip dieback and the length of the tip dieback. A combination of photo and ground plots appears to be the most efficient design for measuring these effects--especially if done over large areas.

PB-205 360
General Mills Chemicals, Inc., Minneapolis, Minn.
FEASIBILITY OF LIQUID ION EXCHANGE FOR EXTRACTING PHOSPHATE FROM WASTEWATER,
LeRoyDitsch, Ronald Swanson, and Albert J. Milun. Oct 70, 47p EPA-WQO-17010-EAP-10/70, W72-01840
Contract FWQA-14-12-590
Report on Water Pollution Control Research Series.
Paper copy available from GPO$0.50 as EP 2.10:17010EAP10/70.

Descriptors: (*Chemical removal (Sewage treatment), *Phosphates), (*Sewage treatment, *Ion exchanging), (*Tin organic compounds, Ion exchanging), Solvent extraction, Organic solvents, Ferrocene, Organometallic compounds, Synthesis (Chemistry).
Identifiers: *Liquid ion exchanging, Benzene sulfonates, *Stannane carboxylic acid/tribenzyl, Stannane/hydroxy-tribenzyl.

The liquid ion exchange extraction process has been used consistently for removing small quantities of uranium, vanadium, copper and other metals in sewage treatment. In successful tests of the ability of liquid ion exchange to remove alkylbenzene sulfonate (ABS) from sewage plant effluents, it was discovered that some phosphorus was removed also. Various metal-containing organic compounds were screened for their activity as liquid ion exchange reagents for phosphate. The compounds were tested for selectivity in extracting inorganic phosphate from water into organic solvents in the presence of chloride, sulfate, and bicarbonate. A tribenzyltin acetate compound was also successful in extracting phosphate.

PB-205 425
California State Dept. of Water Resources, Fresno. San Joaquin District.
REMOVAL OF NITRATE BY AN ALGAL SYSTEM,
Randall L. Brown. Apr 71, 149p DWR-174-10 W72-02975, EPA-WQO-13030-ELY-4/71-7
Contract EPA-WQO-14-06-200-3389A
Report on Bio-Engineering Aspects of Agricultural Drainage, San Joaquin Valley, California. Also available as Rept. no. REC=R2-71-7.

Paper copy available from GPO $1.25 as EP 2.10: 13030 ELY 4/71-7.

Descriptors: (*Chemical removal (Sewage treatment), *Nitrates), (*Algae, *Harvesting), (*Food processing, Algae), Food, Ground water, Water pollution, Nutrients, Cost estimates, Lagoons (Ponds), Feeding stuffs.
Identifiers: *Water pollution control, *High protein supplements, Food supplements, San Joaquin Valley.

An algal system consisting of algae growth, harvesting and disposal was evaluated as a possible means of removing nitrate-nitrogen from subsurface agricultural drainage in the San Joaquin Valley of California. The study of this assimilatory nitrogen removal process was initiated to determine optimum conditions for growth of the algal biomass, seasonal variations in assimilation rates, and methods of harvesting and disposal of the algal product. A secondary objective of the study was to obtain preliminary cost estimates and process design. The growth studies showed that about 75 to 90 percent of the 20 mg/l influent nitrogen was assimilated by shallow (12-inch culture depth) algal cultures receiving 2 to 3 mg/l additional iron and phosphorus and a mixture of 5 percent CO2. The most economical and effective algal harvesting system tested was flocculation and sedimentation followed by filtration of the sediment. The market value for this product as a protein supplement was estimated to be about $80 to $100 per ton.

PB-205 443
Stanford Univ., Calif. Dept. of Civil Engineering.
MOISTURE MOVEMENT IN A HORIZONTAL SOIL COLUMN UNDER THE INFLUENCE OF AN APPLIED PRESSURE.
Doctoral thesis,
William Wen-Gong Yeh. Mar 67, 129p TR-77 W72-02970, EPA-WQO-16060-03/67
Grant PHS-WP-00246

Descriptors: (*Soil water, *Water flow), Ground water, Hydraulic conductivity, Numerical analysis, Hydrology, Darcys law, Capillary pressure, Computer programs, Percolation, Theses, Permeability.

The problem under consideration is that of horizontal moisture movement in a semi-infinite column of homogeneous soil initially at a uniform moisture content and with flow introduced under a certain applied constant pressure at one end. The soil-water system is subdivided into saturated and unsaturated zones. The liquid pore pressure in the saturated zone varies linearly with distance from the applied pressure at the soil face to the critical-suction value at the interface between the saturated and unsaturated zones. (Author)

PB-205 469
PEDCo-ENVIRONMENTAL, Cincinnati, Ohio.
GRIDDED MOTOR VEHICLE EMISSIONS FOR KANSAS CITY AIR QUALITY CONTROL REGION.
Final rept.,
Donald J. Henz. 27 Dec 71, 16p* APTD-0896
Contract EPA-68-02-0044

Descriptors: (*Air pollution, *Missouri), (*Kansas, Air pollution), Urban areas, Exhaust gases, Highway transportation, Rural areas, Particles, Sulfur dioxide, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Inventories, Tables (Data), Motor vehicles.
Identifiers: *Kansas City (Kansas), *Air quality data, Air quality control regions, *Kansas City (Missouri).

Motor vehicle emissions for the Kansas City Interstate Air Quality Control Region are distributed over nine counties. These emissions have been apportioned among 202 grids based on available vehicle-mile data (Kansas urban grids and Missouri rural and urban grids) and estimates of relative motor vehicle emissions (Kansas rural grids). Gridded emissions are tabulated for particulate, sulfur oxides, carbon monoxide, hydrocarbons, and nitrogen oxides in tons per year. (Author)

PB-205 470
PEDCo-ENVIRONMENTAL, Cincinnati, Ohio.
CONTROL STRATEGIES FOR SET II POLLUTANTS KANSAS CITY IAQCR AND S. CENTRAL KANSAS AQCR.
Final rept.,
Donald J. Henz. 28 Dec 71, 42p* APTD-0898
Contract EPA-68-02-0044

Descriptors: (*Air pollution, *Missouri), (*Kansas, Air pollution), Urban areas, Regulations, Abatement, Planning, Exhaust gases, Combustion products, Transportation, Industrial wastes, Motor vehicles, Carbon monoxide, Particles, Hydrocarbons, Sulfur dioxide, Nitrogen oxides, Inventories, Sources.
Identifiers: *Air pollution data, *Implementation Air Pollution Planning Program, *Air pollution standards, Air Quality Control Regions, *Kansas City (Missouri), *Kansas City (Kansas).

The report presents data on the air pollution concentrations which must be met in the Kansas City Air Quality Control Region to meet Federal regulations.

PB-205 476
PEDCo-Environmental Specialist, Inc. Cincinnati, Ohio.
COMPILATION OF APPENDIX D FOR KANSAS CITY AIR QUALITY CONTROL REGION.
Final rept.,
Donald J. Henz. 27 Dec 71, 101p* APTD-0897
Contract EPA-68-02-0044

Descriptors: (*Air pollution, *Missouri), (*Kansas, Air pollution), Urban areas, Inventories, Sources, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Industrial wastes, Fuels, Electric power plants, Transportation, Motor vehicles.
Identifiers: *Kansas City (Missouri), *Kansas City (Kansas), *Air quality data, Air Quality Control Regions.

The report presents data on the sources and concentration of air pollutants in the Kansas City Air Quality Control Region located in Kansas and Missouri. The pollutants studied are particles, sulfur oxides, hydrocarbons, carbon monoxide, and nitrogen oxides.

PB-205 640
National Environmental Research Center, Cincinnati, Ohio.
RADIOLOGICAL SURVEILLANCE STUDIES AT A PRESSURIZED WATER NUCLEAR POWER REACTOR,
Bernd Kahn, Richard L. Blanchard, Harry E. Kolde, Herman L. Krieger, and Seymour Gold.
Aug 71, 105p* EPA-RD-71-1

Descriptors: (*Pollution, *Radioactive contaminants), (*Nuclear reactors, Radioactive contaminants), (*Pressurized water reactors, Radioactive contaminants), Air pollution, Water pollution, Tritium, Monitors, Radiation dosage, Public health, Cooling water, Radioactive wastes, Radioactive isotopes, Iodine isotopes, Aquatic biology, Fishes, Benthos, Wildlife, Radiation effects, Massachusetts.
Identifiers: Yankee Power Reactor.

A radiological surveillance study was undertaken at the Yankee Nuclear Power Station to make available information for calculating population radiation exposures at routinely operating commercial pressurized water reactor (PWR) stations and to demonstrate effective monitoring procedures. Radionuclide concentrations and external radiation were measured in the immediate environment of the station. At the same time, the radionuclide contents of liquids and gases at the station and of effluents at points of discharge were measured, and levels of environmental radioactivity were estimated from these values. The radioactivity in effluents at Yankee consisted mostly of 3H, in amounts typical of PWR stations that use fuel clad in stainless steel. The amounts of other radionuclides discharged to the environment from the reactor plant were very small, apparently because of effective containment of fission products other than 3H within the fuel elements and treatment of wastes by storage (for radioactive decay) and evaporation. A considerable fraction of the effluent radioactivity was discharged at the secondary coolant system because these effluents are released without treatment. (Author)

PB-205 655
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
PRELIMINARY DATA ANALYSIS. 1968 NATIONAL SURVEY OF COMMUNITY SOLID WASTE PRACTICES,
Anton J. Muhich, Albert J. Klee, and Paul W. Britton. 1968, 558p EPA-SW-149-68

Descriptors: (*Waste disposal, Surveys), United States, Urban areas, Rural areas, Earthfills, Refuse disposal, Questionnaires, Land use.
Identifiers: *Solid waste disposal, Sanitary landfills.

The survey conducted in conjunction with a State and interstate planning grant program provides information on the location, types, and amounts of solid wastes being collected and their ultimate disposition. In addition to providing a waste inventory, the survey indicates the manpower, equipment, facilities, and monies required to carry out collection, reduction, and disposal activities. Data from 30 states and the District of Columbia, received before July 1, 1968, are included, as are partially surveyed Indiana, Iowa, and Kansas. National analyses are given for the community data and the land disposal sites and facilities; regional analyses are given for the community data and the land disposal sites. In addition, an urban-rural comparison is provided for the community data. (Author)

PB-205 656
California Univ., Davis. Dept. of Agricultural Engineering.
SOLID WASTE MANAGEMENT / COMPOSTING EUROPEAN ACTIVITY AND AMERICAN POTENTIAL,
Samuel A. Hart. 1968, 49p EPA-SW-2c-68
Paper copy available from GPO $0.50 as FS2.2:SO4/5.

Descriptors: (*Refuse disposal, *Composts), (*Sludge disposal, Composts), (*Western Europe, *Waste disposal), Fertilizers, Industrial plants, Utilization, Economic analysis, Marketing.
Identifiers: *Solid waste disposal, *Waste recycling, Composting.

To appraise the potential for success of future American composting operations, a study of compost utilization and compost utilization research in Germany, Switzerland, and Holland was undertaken in 1966 and 1967. During the investigation, 14 European plants were toured. Data were collected on the processing of refuse into compost, and on compost markets, plant equipment facilities, and procedures. Based on these observations, possible uses of compost in the United States are suggested. In Europe, a limited percentage of domestic refuse is composted because production costs and marketing problems make it impractical to produce more compost than can be sold. (Author)

PB-205 657
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
OBSERVATIONS OF CONTINENTAL EUROPEAN SOLID WASTE MANAGEMENT PRACTICES,
Michael E. Jensen. 1969, 48p EPA-SW-84-69
Paper copy available from GPO $0.55 as FS2.2SO4/19.

Descriptors: (*Western Europe, *Waste disposal), (*refuse disposal, *Composts), (*Incinerators, Waste disposal), Economic analysis, Industrial plants, Management methods, Evaluation, Collection, Grinding (Comminution), Composts, Sludge disposal, Earthfills, Refuse disposal.
Identifiers: *Solid waste disposal, Composting.

Solid waste management practices in Germany, Switzerland, Holland, Sweden, Denmark, and France were observed, and selected European and American solid waste management practices were compared. The report is not intended as a critique of European solid waste management practices since many sections of the report are based on random observations of partial day's operations. A selected list of contacts and operations is included in the report. (Author)

PB-205 807
Booz-Allen and Hamilton, Inc., Washington, D.C.
STUDY TO DETERMINE RESIDENTIAL SOILING COSTS OF PARTICULATE AIR POLLUTION.

15 Oct 70, 201p* APTD-0715
Contract CPA-22-69-103

Descriptors: (*Air pollution, *Public opinion), (*Particles, Air pollution), Attitude surveys, Residential buildings, Questionnaires, Neighborhoods, Dirt, Maintenance, Cost estimates, Pennsylvania.
Identifiers: *Air pollution effects (Materials), Philadelphia (Pennsylvania), Soiling index.

A final report is presented of a survey which was conducted in the Penjerdel area around Philadelphiia, Pennsylvania, through the use of questionnaires, to determine if householders attitudes and behavior toward, and costs of residential cleaning and maintenance operations are affected by the annual level of air particulate matter under which they live. The report consists of six chapters which provide the following information: A summary and description of the methods employed; a summary of the major findings; a detailed description of the soiling cost method for 11 of the cleaning and maintenance operations and the costs computed; and a summary of other findings from personal interview questionnaires. (Author)

PB-205 815
Oklahoma State Univ., Stillwater. School of Mechanical and Aerospace Engineering.
DESIGN CRITERIA FOR HYDROGEN BURNING ENGINES.
Final rept.,
Roger J. Schoeppel. Oct 71, 157p* APTD-0901
Contract EPA-EHSH-70-103

Descriptors: (*Design criteria, Internal combustion engines), (*Internal combustion engines, *Hydrogen), Fossil fuels, Air pollution, Exhaust gases, Combustion products, Nitrogen oxide (NO), Crankcases, Ignition systems, Experimental design.
Identifiers: Hydrogen engines.

Laboratory experiments have demostrated hydrogen not only to be an excellent substitute for conventional hydrocarbon fuels in internal combustion engines but also to have the inherent qualities necessary for a permanent solution to the air pollution problem. This conclusion was reached after extensive tests were conducted with an air-cooled single-cylinder gasoline engine converted to run on hydrogen. The engine's operational characteristics compared favorable with those of its gasoline counterpart. Furthermore, the NOX content of the exhaust was an order of magnitude lower than that expected from a gasoline engine. Trace amounts of unburned hydrocarbons and carbon oxides, also present, originated from the lubricating oil. It was concluded from these experiments that a multi-cylinder automotive engine converted to run on hydrogen should be able to meet the 1975/76 Federal Emission Standards. (Author)

PB-205 824
Engineering-Science, Inc./Texas, Austin.
PETROCHEMICAL EFFLUENTS TREATMENT PRACTICES.
Detailed rept.,
Ernest F. Gloyna, and Davis L. Ford. Feb 70, 292p* W72-03299, FWPCA-12020-2/70-Det
Contract FWPCA-14-12-461
See also Summary rept. dated Feb 70, PB-192-310.

Descriptors: (*Industrial wastes, *Water pollution), (*Chemical industry, Water pollution), (*Industrial waste treatment, Chemical industry), (*Petrochemistry, Water pollution), Reviews, Petroleum products, History, Forecasting, Classifications, Biochemical oxygen demand, Water reclamation, Toxicology, Aquatic biology, Monitors, Economic analysis, Sewage treatment, Alkenes, Aromatic compounds, Phenols, Sulfur organic compounds.
Identifiers: *Water pollution control.

The report reviews various aspects of the petrochemical industry as related to pollution control. The areas reviewed cover the following topics: History; Description (Principal petrochemical products, projected growth); Petroleum raw materials; Petrochemical processes; Chemical and process related classification of wastes; Waste pollutional effects on receiving water (Effects on water use and reuse, physiological effects, identification and monitoring); Treatment and control; Economic aspects of waste treatment.

PB-205 825
Robert S. Kerr Water Research Center, Ada, Okla.
PILOT STUDY OF DYNAMICS OF RESERVOIR DESTRATIFICATION,
Lowell E. Leach, William R. Duffer, and Curtis C. Harlin, Jr. 1968, 37p W72-03234, FWPCA-16080-00/68

Descriptors: (*Reservoirs, Mixing), (*Aeration, Reservoirs), (*Water quality, Aeration), Stratification, Temperature gradients, Dissolved gases, Oxygen, Field tests, Limnology, Oklahoma.
Identifiers: *Thermal stratification, Destratification.

The development of a system for thermal destratification of large reservoirs is presented. Rate of change of the water volume affected and the magnitude of aeration were determined in the central pool of Eufaula Reservoir in eastern Oklahoma. The pilot system was undersized for circulating the entire volume of the central pool, yet 65,000 acre-feet of water below a depth of 22 feet was aerated by the 25th day of operation. Rate of change of hydrodynamic aeration trajectories and thermal effect versus mechanical energy input are discussed. Pilot system design and operational limitations served as a guide for design of a more effective system for continued research and development of destratification of large reservoirs. (Author)

PB-205 826
Robert S. Kerr Water Research Center, Ada, Okla.
THE COMPONENTS OF OXYGENATION IN FLOWING STREAMS,
Francis S. Stay, Jr., William R. Duffer, Billy L. DePrater, and Jack W. Keeley. Apr 67, 30p W72-03235, FWPCA-16050-04/67

Descriptors: (*Water quality, *Aeration), (*Stream pollution, Aeration), Limnology, Oxygen, Dissolved gases, Laboratory equipment, Water pollution, Photosynthesis, Air water interactions, Diffusion, Diurnal variations, Climatology, Benthos, Oklahoma.

The theory of waste assimilation in flowing streams has long been understood and, in a few cases, the application of theory has been made. A basic need in this field lies in the understanding of the behavior of the various components of reaeration and how these differ according to stream type and prevailing climatological conditions. A method is presented which can be used to separate and measure the components of reaeration in flowing waters. Plastic chambers are used to separate the effects of photosynthesis, diffusion, and respiration on the oxygen balance of a stream's regimen and further separate these parameters according to the benthos and organisms which are free-floating. Dissolved oxygen measurements were made in conjunction with supporting information such as atmospheric pressure, temperature, stream velocity profile, light intensity, and the percent of light transmittance to the benthos.

PB-205 827
Robert S. Kerr Water Research Center, Ada, Okla.
IRON-59 AS A SOLIDS TRACER IN AQUEOUS SUSPENSIONS,
Marion R. Scalf, Jack L. Witherow, and Charles P. Priesing. Oct 67, 36p W72-03236, FWPCA-16020-10/67
Presented at the ASCE Meeting, Texas Section, Held at Abilene, Tex. on 6-7 Oct 67.

Descriptors: (*Sewage treatment, *Tracer studies), (*Iron isotopes, *Labeled substances), (*Suspended sediments, Tracer studies), Radioactive isotopes, Design criteria, Lagoons (Ponds), Settling basins, Water pollution.
Identifiers: Iron 59.

Detention time is of primary importance in many waste treatment processes and probably the most universal design standard. The purpose of the paper is to introduce a radiotracer for determining the detention of particulate matter in hydraulic systems and to demonstrate simple, fast, and reliable methods of combining this tracer with dye tracers to determine the hydraulic performance of sewage treatment processes. Tracer methods using iron-59 were devised and are described for silt tracing in rivers and reservoirs, suspension tracing in lagoons, and sludge handling processes. Iron-59 almost completely adheres to particulate matter when introduced into a sewage suspension. (Author)

PB-205 891
Southwest Research Inst., Houston, Tex.
COLLABORATIVE STUDY OF REFERENCE METHOD FOR DETERMINATION OF SULFUR DIOXIDE IN THE ATMOSPHERE (PARAROSANILINE METHOD),
Herbert C. McKee, Ralph E. Childers, and Oscar Saenz, Jr. Sep 71, 58p* APTD-0903
Contract CPA-70-40
Errata sheet inserted.

Descriptors: (*Sulfur dioxide, *Gas analysis), (*Air pollution, Sulfur dioxide), Colorimetric analysis, Tests, Statistical analysis, Variations, Errors, Laboratories, Calibrating.
Identifiers: *Air pollution detection, Pararosaniline method.

The report presents information obtained in the evaluation and collaborative testing of a reference method for measuring the sulfur dioxide content of the atmosphere. The technique is called the pararosaniline dye method or sometimes the West-Gaeke method. Different variations of this method have been used extensively by many laboratories since the original publication in 1956, and it has been found to be reliable and reasonably free of in-

terferences. Collaborative tests were performed involving a total of eighteen laboratories. A statistical analysis of the data of fourteen laboratories provided the following results, based on the analysis of pure synthetic atmospheres using the 30-min sampling procedure and the sulfite calibration method prescribed. Results are also presented with respect to the use of control samples and reagent blank samples, the minimum number of samples required to establish validity of results within stated limits, and the statistical evaluation of various steps included in the method. The method can give satisfactory results only when followed rigorously by experienced laboratory personnel. The publication of the method in the Federal Register, April 30, 1971, as the reference method to be used in connection with Federal ambient air quality standards for sulfur dioxide is appended.

PB-205 892
Southwest Research Inst., Houston, Tex.
COLLABORATIVE STUDY OF REFERENCE METHOD FOR THE DETERMINATION OF SUSPENDED PARTICULATES IN THE ATMOSPHERE (HIGH VOLUME METHOD),
Herbert C. McKee, Ralph E. Childers, and Oscar Saenz, Jr. Jun 71, 27p* APTD-0904
Contract CPA-70-40
Errata sheet inserted.

Descriptors: (*Gas sampling, *Particles), (*Air pollution, Gas sampling), Tests, Statistical analysis, Variations, Errors, Laboratories, Calibrating.
Identifiers: *Air pollution detection.

Of all the various methods available to measure atmospheric particle contaminants, the so-called High Volume Method (frequently called 'Hi Vol' Method) has probably been used more extensively than any other. Since no standardized procedure has been available to guide different laboratories in the use of this method, each laboratory has had to develop and evaluate different techniques. The report presents the results of a collaborative test of the High Volume Method. A statistical analysis of the data obtained provided the following results: The relative standard deviation for single analyst variation; The relative standard deviation for multilaboratory variation is 3.7 percent; and the minimum detectable amount of particulate matter is 3 mg (95 percent confidence level). The method is rugged, and variations in procedure and technique can occur with only a minor effect on the results.

PB-205 893
Southwest Research Inst., Houston, Tex.
MEASUREMENT OF NON-METHANE HYDROCARBONS,
Oscar Saena, Jr., Clarence A. Boldt, Jr., and David S. Tarazi. Jun 71, 33p* APTD-0905
Contract CPA-70-40

Descriptors: (*Gas detectors, *Hydrocarbons), (*Air pollution, Hydrocarbons), Ionization gages, Methane, Gas sampling, Monitors, Calibrating, Air pollution, Activated carbon.
Identifiers: *Air pollution detection.

Because of recent air pollution laws, there is need of an accurate mobile hydrocarbon analyzer. Measurement of so-called 'non-methane hydrocarbons' was carried out in a mobile laboratory using a flame ionization detector. Total hydrocarbons were measured by running air directly through the detector. Methane was measured by running air through a methane-saturated carbon column which retained all organic contaminants other than methane. The difference was then the 'non-methane hydrocarbons.' Bag sampling may be superior to continuous monitoring, depending on circumstances. Sensitivity appears to be marginal in view of the federal standards. The method is subject to error due to difficulties in calibration, temperature control, and other variables. (Author)

PB-205 935
Southwest Research Inst., Houston, Tex.
COMPARISON OF AMBIENT AIR MEASUREMENT AND SOURCE MEASUREMENT,
Herbert C. McKee. Apr 71, 24p APTD-0902
Contract CPA-70-40

Descriptors: (*Air pollution, Standards), Monitors, Gas detectors, Gas analysis, Sources, Atmospheric composition.
Identifiers: *Air pollution standards, *Air pollution detection.

The report was prepared to aid in planning a program to standardize methods of source measurement used in air pollution control. Many differences exist between methods used for ambient air measurement and source measurement, related to the differences in concentration, temperature and humidity of the sample streams, interferences that affect analytical results, and other factors. The differences in the two types of methods have been substantial, therefore results obtained with these different methods likely are not equivalent. Emission standards have little meaning unless a method of measurement is specified, and specific methods or general guidelines have usually been published with such standards. The need for a standardization program is outlined.

PB-205 936
Copley International Corp., New York.
A STUDY OF THE SOCIAL AND ECONOMIC IMPACT OF ODORS. PHASE II.
Final rept.

Nov 71, 313p* APTD-09899
Contract CPA-70-116
See also Phase 1, PB-194 376.

Descriptors: (*Odors, *Public opinion), (*Air pollution, Odors), Attitude surveys, Socioeconomic status, Urban areas, Economic analysis, Industrial wastes, Bias, Sources, Assessments, Bibliographies, Questionnaires, Food processing, Refineries, Sewage treatment, Chemical industry, California.
Identifiers: Los Angeles (California).

The results are presented of the second phase of research undertaken to establish air quality, performance and emission standards that specify what levels of odors are acceptable or how such levels should be determined. The ultimate objective of the research was the development of a method to assess the social and economic aspects of community odor problems. To accomplish this end the following tasks were undertaken: A metropolitan area was selected from a list of 31 potential odor problem areas; Public attitude surveys and technical field studies were conducted simultaneously; Comprehensive analysis of social and economic effects of odors was conducted, particularly as reflected in residential property values; A set of assessment procedures was prepared.

PB-205 952
Illinois State Geological Survey, Urbana.
SULFUR REDUCTION OF ILLINOIS COALS — WASHABILITY STUDIES. PHASE II.
Final rept.,
R. J. Helfinstine, N. F. Shimp, J. A. Simon, and M. E. Hopkins. 28 Jul 71, 32p APTD-0841
Contract PH-86-67-206

Descriptors: (*Coal, Sulfur), (*Sulfur, Gravity separation), Coal preparation, Washing, Settlers (Separators), Removal, Grindability, Size separation, Size determination, Fractions, Illinois.
Identifiers: *Sulfur reduction, Illinois coals.

The report describes Phase II of an investigation to determine, by gravity separation technique, the extent to which the sulfur content of Illinois coals can be reduced and to study other washability characteristics. Twenty-seven mine samples were obtained, crushed to a top size of 3/8 inch, screened to 3/8 inch x 28 mesh, and separated into several specific gravity fractions which were subsequently analyzed. It was found that only 5 of the 27 samples came from mines that could produce coal with less than 1.5 percent total sulfur, and these 5 samples were from mines with relatively low sulfur content in the raw coal. (Author)

PB-206 005
Northern Research and Engineering Corp., Cambridge, Mass.
CONTROL OF NITROGEN OXIDE EMISSIONS FROM DIESEL ENGINES: A THEORETICAL ANALYSIS,
E. K. Bastress, K. M. Chng, D. M. Dix, and R. J. Murad. 8 Jun 71, 106p* NREC-1160-1 APTD-0906
Contract EHS-70-116

Descriptors: (*Diesel engines, Exhaust gases), (*Air pollution, Nitrogen oxides), (*Exhaust gases, *Nitrogen oxides), Mathematical models, Design criteria, Combustion, Fuel injectors, Automobile engines.
Identifiers: *Diesel engine exhaust, *Air pollution control.

The report is concerned with the control of NOx emissions from diesel engines. The objective was to correlate engine design, performance, and emission characteristics by theoretical analysis, and to develop NOx-control criteria. Mathematical models of combustion and NO formation in diesel engines were developed; engine design, performance, and emission characteristics were correlated; and methods for controlling NO emissions were identified and evaluated. In direct-injection engines, NO emission rate is found to vary monotonically with fuel injection time, injection rate, and over-all fuel-air ratio. Qualitative guidelines have been defined for reducing NO emissions by manipulation of these design variables while minimizing the associated penalties in engine performance. The tendency for indirect-injection engines to produce lower NO emissions than direct-injection engines has been confirmed by the model. The direct-injection engine model has been used to evaluate turbo-charging, pilot injection, and fumigation as methods for reducing NO emissions. Of the approaches considered, only fumigation was found to decrease NO emissions.

PB-206 019
Aerojet-General Corp., El Monte, Calif. Environmental Systems Div.
RESEARCH AND DEVELOPMENT OF NEW POLYMER SYSTEMS FOR REVERSE OSMOSIS MEMBRANES.
Research and development progress rept.,
C. W. Saltonstall, Jr., and W. S. Higley. Oct 68, 71p OSW-PR-360
Contract DI-14-01-0001-1093

Descriptors: (*Desalting, Osmosis), (*Osmosis, *Membranes), Polycarbonate resins, Performance evaluation, Polymeric films, Flux (Rate), Acrylonitrile copolymers, Collagens, Cellulosic resins, Ethyl cellulose, Polyacrylamides, Mechanical properties, Fabrication, Casting, Polymerization.
Identifiers: *Reverse osmosis desalination.

The object of the research was to develope new reverse osmosis membranes superior to cellulose acetate. Poly (vinylene carbonate) which was polymerized from the purified monomer as required was evaluated in the form of thin or ultrathin films. Knife-cast films showed increasing flux and decreasing salt retention with time and eventual loss of useful osmotic properties. Copolymers of vinylene carbonate were prepared and evaluated. Attempts to prepare a copolymer from vinylene carbonate and N-vinyl-2-pyrrolidone comonomers in bulk were not successful. Acetone soluble nitrile polymers and copolymers prepared from methacrylonitrile were also investigated as were films of a microcrystalline form

of collagen. The incorporation of 10% poly (diacetone acrylamide) into ethyl cellulose resulted in films with salt retentions of 98.3 to 99.5%.

PB-206 115
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
TOLEDO AIR POLLUTANT EMISSION INVENTORY,
David V. Mason. Jul 69, 59p* APTD-0888

Descriptors: (*Air pollution, *Ohio), (*Michigan, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Toledo (Ohio), Monroe County (Michigan), Lucas County (Ohio), Wood County (Ohio), Ottawa County (Ohio), Sandusky County (Ohio).

The report presents the emission inventory of the Toledo, Ohio metropolitan area. Emissions of five pollutants (SO (x), Particulates, CO, Hydrocarbons, and NO (x)) are estimated for 1967. Summaries of the estimates are tabulated for each pollutant by subcategories within four source categories: transportation, combustion of fuels by stationary sources; refuse disposal; and industrial process emissions. Detailed estimates by category, and by a grid coordinate system are presented. For each pollutant five densities of emission are plotted on a grid of the area.

PB-206 140
California Univ., Berkeley. Sanitary Engineering Research Lab.
PROVISIONAL ALGAL ASSAY PROCEDURES.
Final rept.,
D. F. Toerien, C. H. Huang, J. Radimsky, E. A. Pearson, and J. Scherfig. Oct 71, SERL-71-6 W72-03985, EPA-WQO-16010-DQB-10/71

Descriptors: (*Algae, *Bioassay), (*Nutrients, *Indicator species), (*Limnology, Algae), Standards, Plant growth, Concentration (Composition), Biomass, Monitors, Field tests, Error analysis.
Identifiers: *Eutrophication.

Batch and continuous flow (chemostat) assays were investigated as part of a joint industry-government sponsored, multilaboratory effort to develop a standardized algal assay procedure for nutrient level assessment. Assays were conducted with Selenastrum capricornutum as a standard assay organism. It is recommended that batch type algal assays be used only for crude screening or routine monitoring purposes and that the chemostat should be used for the quantitative assessment of the algal growth supporting properties of waters as well as for the development of kinetic descriptions for nuisance algae and the rate limiting nutrients of concern.

PB-206 142
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING OF COAL RESERVES BY SULFUR LEVEL: STUDY AREA REPORT,
John C. Goodrich, and Howard T. Fisher. Apr 71, 282p* APTD-0728
Contract CPA-70-16

Descriptors: (*Coal deposits, *Mapping), (*Sulfur, Coal deposits), Computer programming, Coal mines, Graphic methods, Automatic mapping, Data processing, Air pollution, Maryland, FORTRAN.
Identifiers: *Computer mapping techniques, Computer graphics, SYMAP computer program, Coal (High sulfur), Coal (Low sulfur), Appalachian region.

The aim was to display the quantity of coal available at various sulfur levels. The study areas were in the Appalachian Coal Region and, in particular, in a two county area in Maryland. Values for sulfur content, bed thickness, and quantity of coal were manipulated and mapped using several computer mapping programs. The problem definition, computer program used, study area selection and data acquisition, and the graphic techniques used are covered. The study areas and data used, and the computer maps produced are discussed in some detail. The step by step description of the mapping procedures used for the study areas, the references, and the technical aspects of program development are presented.

PB-206 143
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
COMPUTER MAPPING OF COAL RESERVES BY SULFUR LEVEL: GENERAL DOCUMENTATION. PART II,
John C. Goodrich, and Howard T. Fisher. Apr 71, 283p APTD-0729
Contract CPA-70-16
See also Part 1, PB-203 400.

Descriptors: (*Coal deposits, *Mapping), (*Sulfur, Coal deposits), Computer programs, Coal mines, Graphic methods, Automatic mapping, Data processing, Air pollution, FORTRAN.
Identifiers: *Computer mapping techniques, *Computer graphics, SYMAP computer program, Coal (Low sulfur), Coal (High sulfur).

There is interest in ways of displaying the quantity of coal available at various sulfur levels. It was felt that computer mapping of the coal data might provide a relatively quick and inexpensive tool. The mapping was accomplished using the SYMAP computer program. The report contains eight sections: introduction to SYMAP, preparation of packages, map package electives, user subroutine and advanced uses, programming and systems guide, the SYMVU program, the GRID program, and program modifications. This includes all of the technical material necessary to prepare, interpret, and use the three programs, as well as the program modifications made during the project.

PB-206 144
Environmental Protection Agency, Athens, Ga. Southeast Water Lab.
CATALOG OF PESTICIDE NMR SPECTRA,
A. L. Alford, and L. H. Keith. Apr 71, 164p W72-03541, EPA-WQO-16020-EWC-04/71
Paper copy available from GPO $1.50 as I67.13/4:16020EWC04/1.

Descriptors: (*Pesticides, *Nuclear magnetic resonance), (*Insecticides, Nuclear magnetic resonance), Tables (Data), Phosphorus organic acid esters, Carbamates, DDT, Chlorine organic compounds, Sulfur organic compounds.

Nuclear magnetic resonance spectra have been recorded, interpreted, and published for organophosphorus pesticides, DDT and related compounds, and carbamate pesticides and some of their degradation products. A Varian HA-100 NMR spectrometer with a variable-temperature probe and a homonuclear spin decoupler was used to record the spectra of 114 compounds. Chemical shifts and coupling constants are shown for each spectrum. The chemical name and source of each pesticide are listed.

PB-206 145
Florida Univ., Gainesville.
FEASIBILITY OF TREATING WASTEWATER BY DISTILLATION.
Water pollution control research series.
Feb 71, 85p W72-03610, EPA-WQO-17040-DNM-02/71
Contract FWPCA-14-12-571
Paper copy available from GPO $1.00 as EP2:10:17040DNM02/71.

Descriptors: (*Sewage treatment, *Water reclamation), (*Distillation, Sewage treatment), Evaporators, Scale (Corrosion), Odor control, Ammonia, Aeration, Performance evaluation, Fouling.
Identifiers: *Verticle tube evaporation, Water pollution control.

The technical feasibility of evaporation of municipal sewage treatment plant effluent for the purpose of water reuse was investigated. The equipment used was a long tube vertical (LTV) evaporator. The objectives of the research were to determine the effects of feedwater quality, and evaporation conditions on product water quality, post evaporation polishing, and evaporator tube scaling. The experimental equipment consisted of a three-effect evaporator constructed of 316 stainless steel. Feedwaters tested in the evaporator included extended aeration effluent, high rate trickling filter effluent, and contact stabilization effluent. The scaling evaluations were carried out under pressure conditions using extended aeration and trickling filter effluent. Because of increased efficiencies, wastewater evaporation should be more economical than sea water evaporation. (Author)

PB-206 146
Synectics Corp., Allison Park, Pa.
A SYSTEM FOR INDUSTRIAL WASTE TREATMENT RD AND D PROJECT PRIORITY ASSIGNMENT.
Water pollution control research series.

Feb 71, 96p W72-03611, EPA-WQO-12000-FLX-02/71
Contract EPA-WQO-14-12-840
Paper copy available from GPO $1.00 as I67.13/4:12000FLX02/1.

Descriptors: (*Water pollution, *Research management), Computer programming, Contract administration, Research products, Benefit cost analysis, Management planning, Water quality, Industrial waste treatment, Sewage treatment.

A computerizable analysis system for determining maximum benefit per increment of capital expenditure has been developed to aid the Environmental Protection Agency in selecting those research projects which will provide the greatest amount of water pollution abatement per dollar expended. Five main subsets with a total of 24 information sources are used to provide input, with the variables listed in terms of relative rankings rather than absolute values. The subsets are: (1) Effluent constituents; (2) Industrial groups; (3) State dimensions; (4) Project descriptions; and (5) General statistics. The system has been developed for implementation on the basis of aggregation of data on a state-by-state basis, but the geographical base may be readily expanded to include river basins, or contracted to run on a county by county basis. The system accounts for both past and current fundings of projects, allows policy decisions on the part of EPA management to be superimposed at several levels, and permits analysis of the effects of various policy decisions.

PB-206 154
Battelle Memorial Inst., Richland, Wash.
INORGANIC FERTILIZER AND PHOSPHATE MINING INDUSTRIES--WATER POLLUTION AND CONTROL.
Sep 71, 228p W72-03983, EPA-WQO-12020-FPD-09/71
Paper copy available from GPO $1.75 as I67.13/4:12020FPD09/1.

Descriptors: (*Water pollution, *Phosphates), (*Industrial waste treatment, Phosphates), (*Fertilizers, Water pollution), (*Nitrogen inorganic compounds, Water pollution), Industrial wastes, Mining, Surveys, Industrial water, Beneficiation, Economic analysis, Cost estimates, Processing, Phosphoric acid, Chemical engineering, Ammonia, Ammonium compounds, Nitrates, Nutrients.

Identifiers: *Phosphate mining, Water pollution control, Phosphate slimes.

A state-of-the-art survey was made of the water pollution problems which result from the production of inorganic fertilizers and phosphate rock. Information required to complete the study was obtained through an extensive literature search, questionnaires sent to the major fertilizer producers, and visits to selected production plants. Ninety eight plants representing thirty three different companies were surveyed. Production figures since 1940 and estimates of production through 1980 were accumulated for phosphate rock and the major fertilizer products. The specific production operations which are the principal generators of contaminated waste waters were identifed, and the waste water volumes and compositions for each operation were determined wherever possible. The capability of current technology to treat and control the contaminated waste waters generated by the fertilizer industry was evaluated. Problem areas where additional research and development effort is needed to provide adequate control of waste water discharge were identified.

PB-206 155
Environmental Protection Agency, College, Alaska. Alaska Water Lab.
ENVIRONMENTAL GUIDELINES FOR ROAD CONSTRUCTION IN ALASKA,
Frederick B. Lotspeich. Aug 71, 223p* W72-03984, EPA-WQO-1610-GOI-09/71

Descriptors: (*Roads, Alaska), (*Cold weather construction, Roads), Roadbeds, Frozen soils, Tundra, Maintenance, Route surveys, Design, Earthwork, Soil mechanics, Civil engineering, Instructions.

The purpose is to compile and describe the best practical measures required to assure environmental protection during road construction under cold climate conditions. This report summarizes accepted road construction methods for Alaska which, if followed, will help to minimize environmental degradation.

PB-206 184
Virginia Cooperative Fishery Univ, Blacksburg.
STREAM FAUNAL RECOVERY AFTER MANGANESE STRIP MINE RECLAMATION,
Kenneth B. Cumming, and Donley M. Hill. Jun 71, 41p EPA-WQO-18050-DOH-06/71, W72-03530
Contract FWPCA-WP-01530
Paper copy available from GPO $0.50 as EP2.10:18050DOH06/71.

Descriptors: (*Water pollution, Mine waters), (*Fishes, Water pollution), (*Toxicology, *Mine waters), (*Manganese inorganic compounds, Water pollution), Turbidity, Virginia, Strip mining, Bioassay, Spoil, Surface water runoff, Land reclamation.
Identifiers: *Water pollution effects (Animals), *Manganese mining.

The results of the investigation suggest a number of conditions to be met for effective reclamation particularly of manganese strip mines, and in general any surface mining which tends to increase the degree of siltation and turbidity in receiving waters. Seasonal monitoring of certain chemical, physical, and biological parameters of streams draining manganese strip mine spoils in three stages of reclamation verified that the community structure of fish and benthic macroinvertebrates in these streams remains severely depressed until complete reclamation of the spoils has been accomplished. Laboratory studies established the median tolerance limits of three native species of fishes to silt in suspension and to manganese ions. These studies suggest that the principal factor depressing the faunal communities in partially reclaimed and unreclaimed streams is the chronically high degree of turbidity and siltration.

PB-206 190
Rutgers - The State Univ., New Brunswick, N.J. Water Resources Research Inst.
OXYGEN REGENERATION OF POLLUTED RIVERS. THE PASSAIC RIVER.

Mar 71, 65p W72-03780, EPA-WQO-16080-FYA-03/71
Paper copy available from GPO $0.65 as EP2.10:16080FYA03/71.

Descriptors: (*Water pollution, Aeration), (*Stream pollution, *Aeration), Field tests, Oxygen, Dissolved gases, Water quality, Biochemical oxygen demand, Mathematical models, Barriers, Aerators, Diffusion.
Identifiers: Passaic River.

Field tests were made of a mechanical surface aerator and of pure oxygen diffusers in a small polluted river, the upper Passaic, New Jersey. Their purpose to raise the dissolved oxygen level in polluted waters. Results generally corroborated results of previous test, as to performance of surface aerators on such rivers, in excavated pools. A somewhat higher oxygen transfer rate was obtained with a flow concentration device, which, in a permanent installation, would take the form of low rock spur dikes, one extending from each bank, or flow concentration groins. Tests of oxygen diffusers were fragmentary. A dye dispersion test gave a very high longitudinal dispersion coefficient downstream of the aerator. Mathematical modelling indicated that during the period of test, parameters of biochemical deoxygenation were not changed by the artificial aeration process. (See also W72-03779)

PB-206 191
Southern Research Inst., Birmingham, Ala.
DEMINERALIZATION OF WASTEWATER BY THE TRANSPORT-DEPLETION PROCESS,
Robert E. Lacey, and Everett L. Huffman. Feb 71, 65p W72-03782, EPA-WQO-17040-EUN-02/71
Contracts FWQA-14-12-443, FWQA-14-12-812
Paper copy available from GPO $0.65 as I67.13/4:17040EUN02/1.

Descriptors: (*Sewage treatment, *Electrodialysis), (*Chemical removal (Sewage treatment), Electrodialysis), (*Demineralizing, Sewage treatment), Membranes, Demineralization, Fouling, Ion exchange resins, Flushing, Cost estimates, Feed water treatment, Performance evaluation, Regenerated cellulose.
Identifiers: Transport depletion process.

The transport-depletion process was investigated for demineralizing clarified or filtered municipal secondary effluent. Regenerated-cellulose membranes were not effective. The major problems encountered in demineralization of wastewaters by conventional electrodialysis, fouling and scaling, were, however, largely overcome by the use of a special anion-selective membrane and periodic flushing of the stack with sodium chloride solution. Membrane fouling was largely overcome by flushing the stack with a sodium chloride solution. Cost estimates are given.

PB-206 192
Rensselaer Polytechnic Inst., Troy, N. Y. Bio-Environmental Engineering Div.
CONTROL OF POLLUTION FROM OUTBOARD ENGINE EXHAUST. A RECONNAISSANCE STUDY.

Sep 71, 42p W72-03783, EPA-WQO-15020-ENN-09/71
Paper copy available from GPO $0.50 as 167.13/4:15020ENN09/71.

Descriptors: (*Water pollution, Oils), (*Outboard engines, Water pollution), (*Marine engines, Water pollution), Biodeterioration, Recreation, Gasoline, Aquatic microbiology, Solubility, Tests, Two stroke cycle engines, Exhaust emissions.
Identifiers: *Oil pollution, *Water pollution control equipment, Oil pollution control.

A reconnaissance study has been made to determine the extent of pollution which results from the operation of a two-cycle outboard engine. Comparisons have been made of engine operation with and without a pollution control device attached. Studies have also been made of the biodegradability of the fuel and exhaust products. Tests made in a swimming tank with an untuned engine have shown that the quantity of fuel wasted as exhaust varied from about 7 percent of the volume of fuel used at high speeds, to over 30 percent at low speeds. When the Goggi pollution control device was installed, these quantities were intercepted and collected rather than discharged with the exhaust. Analysis at various depths indicated that nearly all products separated from the water in a short time and collected on the surface. Various analytical techniques were studied. Both fuel and exhaust products are capable of supporting microbial growth. (EPA abstract)

PB-206 193
Little (Arthur D.), Inc., Cambridge, Mass.
CHARACTERIZATION AND SEPARATION OF SECONDARY EFFLUENT COMPONENTS BY MOLECULAR WEIGHT.
Water pollution control research series.

Mar 71, 46p W72-03784, EPA-WQO-16020-FEN-03/71
Contracts EPA-WQO-14-12-886
Paper copy available from GPO $0.55 as I67.13/4:16020FEN0371.

Descriptors: (*Sewage, Chemical analysis), (*Spectroscopic analysis, Sewage), Separation, Filtration, Membranes, Infrared spectra, Ultraviolet spectra, Mass spectra, Molecular weight, Solvent extration, Thin layer chromatography.
Identifiers: Ultrafiltration, Secondary sewage treatment.

The purpose of the research was to explore the appropriateness of various methods for separating and characterizing municipal secondary waste effluent. After examing several methods, it was found that a combination of membrane ultrafiltration, solvent extraction, thin layer chromatography, and high resolution mass spectrometry was most appropriate. Infrared, mass, and ultraviolet spectroscopy was used to analysis the effluent fractions. High resolution mass spectrometry (HRMS) shows promise for being able to obtain a great deal of specific chemical information even from still very complex mixtures. (Author)

PB-206 194
Truax-Traer Coal Co., Pinckneyville, Ill.
CONTROL OF MINE DRAINAGE FROM COAL MINE MINERAL WASTES. PHASE I. HYDROLOGY AND RELATED EXPERIMENTS,
G. L. Barthauer, Z. V. Kosowski, and J. P. Ramsey. Aug 71, 144p W72-03785, EPA-WQO14010-DDH-08/71
Paper copy available from GPO $1.25 as EP2.10:14010DDH08/71.

Descriptors: (*Water pollution, *Mine waters), (*Coal mines, Tailings), (*Tailings, Water pollution), Land reclamation, Waste disposal, Surface water runoff, Ground cover, Grasses, Hydrology, Acidity.
Identifiers: Coal mine spoils, *Water pollution control, *Mine acid drainage, Mine wastes.

A project has been underway which attempts to demonstrate practical means of abating pollution from coal mine mineral wastes. The site included a refuse pile occupying approximately 40 acres and a slurry lagoon complex of 50 acres. In the report, the characteristics and acid formation rate of the refuse pile are described. The average rate of acid formation for this refuse pile is 198 pounds of acidity, as CaCO3, per acre per day. Acid contribution from the slurry lagoons was not determined but appears to be negligible. As an abatement measure, a number of experimental vegetative covers were tested. Grass was successfully

established with and without the use of topsoil, weathering well for one year. The long-term effects of establishing a grass cover directly on the refuse without the use of topsoil are not known at this time. (Author)

PB-206 216
Bureau of Radiological Health, Rockville, Md. Div of Electronic Products.
RADIOFREQUENCY AND MICROWAVE RADIATION LEVELS RESULTING FROM MAN-MADE SOURCES IN THE WASHINGTON, D. C., AREA,
Stephen W. Smith, and David G. Brown. Nov 71, 62p BRH/DEP-72-5 FDA-72-8015
Prepared in cooperation with White Electromagnetics, Inc.
Paper copy available from GPO $0.75 as stock no. 1712-0135.

Descriptors: (*Electromagnetic radiation, *District of Columbia), Radiometry, Radiation hazards, Microwaves, Radio towers, Radar equipment, Background radiation, Urban areas, Health physics.

In order to determine the typical levels of radiofrequency and microwave radiation that result from man-made sources in an urban environment, measurements were made of peak power densities in the Washington, D.C., area during the summer of 1969. The highest levels measured (approximately .01 mW/sq cm) originated primarily from AM broadcast towers and airport radar installations. (Author)

PB-206 218
Littleton Research and Engineering Corp., Mass.
OPTIMUM MECHANICAL AERATION SYSTEMS FOR RIVERS AND PONDS.
Water pollution control series,
William T. Hogan, F. Everett Reed, and Albert W. Starbird. Nov 70, 136p W72-03781, EPA-WQO-16080-DOO-07/70
Contract EPA-14-12-576
Paper copy available from GPO $1.25 as EP2.10:16080DOO7/70.

Descriptors: (*Aeration, *Stream pollution), (*Lakes, Aeration), Air entrainment, Oxygenation, Cost estimates, Oxygen, Circulation, Water quality, Mixing, Dissolved gases, Aerators, Hydraulic engineering, Nutrients.
Identifiers: Eutrophication, Water pollution control.

The report is concerned with economical methods for maintaining high levels of dissolved oxygen in quiet rivers and ponds. The object being to control eutrophication of bodies of water with a high nutrient content. The annual cost of adding oxygen to streams and lakes is estimated for a variety of existing and new aerating devices. Analytical and empirical equations are presented for the determination of operating characteristics of the various devices used to aerate natural bodies of water. The most economical means of artificial aeration generally possible for streams was found to be mechanical aerators which generate a highly turbulent white-water surface. For a lake, the most economical technique for the continual input of oxygen into a lake was found to be diffused aeration using air bubbles. The most economical technique for rapid input of oxygen, operating only while the lake is being destratified, was found to be a hybrid system which draws water from the lake bottom and discharges it at the surface where it is aerated by a mechanical aerator. (Author)

PB-206 219
Washington Univ., Seattle. Inst. of Forest Products.
POLLUTION ABATEMENT BY FIBER MODIFICATION.
Water pollution control research series.
Jan 71, 63p W72-03982, EPA-WQO-12040-EFC-01/71
Paper copy available from GPO $0.65 as EP2.10:12040EFC01/71.

Descriptors: (*Spent liquors (Pulping), *Industrial waste treatment), (*Water pollution, Spent liquors (Pulping)), (*Triazines, Dyeing), (*Wood fibers, Dyeing), Utilization, pH, Wood fibers, Lignocellulose, Polymerization, Chlorine organic compounds, Amination, Spent sulfite liquors, Sulfonates.
Identifiers: *Lignosulfonates, *Water pollution control, Triazine/dichloro.

The research goal undertaken was to develop systems capable of abating the pollution resulting from the discharge of lignosulfonates or bleach plant effluent by finding a suitable use for these pollutants. It was desired to devise procedures for the attachment of lignosulfonates or other lignin-derived pollutants to wood or pulp fibers to create useful fiber-polymer composites. The plan was predicated upon the then unrecognized potential of fiber reactive dye chemistry as a general foundation for fiber modification. The report describes research to determine whether the chemistry developed for dyeing cotton was applicable to wood derived fibers of differing morphology and chemical composition. A typical dichloro-s-triazine fiber reactive dye was selected because of its availability and because after reaction it would still be expected to contain one reactive chlorine suitable for the attachment of pollutants. The dye was found to react with a wood-derived fibers suitable for the subsequent attachment of lignosulfonates or bleach plant effluents. The effects of various reaction conditions including pH and time, were investigated and are reported.

PB-206 231
Continental Oil Co., Ponca City, Okla. Research and Development Dept.
MICROBIOLOGICAL TREATMENT OF ACID MINE DRAINAGE WATERS.
Water pollution control research series.
Sep 71, 85p W72-04100, EPA-WQO-14010-ENW-09/71
Paper copy available from GPO $1.00 as EP2.10:14010 ENW 09/71.

Descriptors: (*Mine waters, *Biodeterioration), (*Ferrobacillus, Mine waters), (*Thiobacillus, Mine waters), Aeration, Iron, Neutralizing, Limestone, Oxidation, Hydrogen sulfide, Desulfovibrio, Phosphates.
Identifiers: *Mine acid drainage.

The purpose of the study was to determine if the abilities of certain bacteria to oxidize ferrous iron or to convert sulfate to hydrogen sulfide could be applied to the neutralization and subsequent removal of iron from difficult-to-treat mine drainage waters. If one or both of these concepts could be successfully utilized, the expense of adequately treating these types of problem waters might be significantly reduced. Laboratory studies demonstrated that both pure cultures and fresh field cultures of acidophilic iron bacteria could readily oxidize ferrous iron in both synthetic and natural acid mine drainage waters. Approximate requirements of oxygen, carbon dioxide, nitrogen and phosphorus by the iron bacteria were established. Limestone neutralizations of partially oxidized acid mine waters were conducted. Although sulfate-reducing bacteria were isolated, attempts to grow the cultures or produce hydrogen sulfide at pH values below 5.5 were unsuccessful.

PB-206 232
Stanley Consultants, Cleveland, Ohio.
FEASIBILITY STUDY UPPER MEANDER CREEK. MINE DRAINAGE ABATEMENT PROJECT.
Water pollution control research series.
Sep 71, 54p W72-04101, EPA-WQO-14010-HBQ-09/71
Contract DI-68-01-0063
Paper copy available from GPO $0.60 as EP2.10:14010HBQ09/71.

Descriptors: (*Water pollution, *Mine waters), (*Land reclamation, *Strip mining), Surface drainage, Cost estimates, Erosion control, Feasibility, Esthetics, Water quality, Vegetation.
Identifiers: *Water pollution control, *Mine acid drainage.

The Upper Meander Creek Site in Mahoning County, Ohio, has been extensively surface mined for coal. Revegetation of the spoil area has met with only limited success, leaving the majority of the site generally devoid of tree and grass cover and subject to rapid runoff and severe erosion. A mine drainage abatement demonstration project is recommended for the area to demonstrate effective techniques for mine drainage abatement and beneficial utilization of a mined area, and also to solve a specific mine drainage problem. The report is a presentation of an evaluation of the feasibility of such a mine drainage control demonstration project.

PB-206 237
New Mexico State Univ., University Park. Engineering Experiment Station.
CONTROLLING FACTORS IN METHANE FERMENTATION.
Final rept. 1 Sep 68-31 Aug 69,
R. E. Speece, and Ralph Clark. Sep 69, 252p
NMSU-EES-61-70 W72-04097, EPA-WQO-17070-06/69
Grant FWPCA-WP-01001

Descriptors: (*Sewage treatment, Fermentation), (*Fermentation, *pH control), (*Anaerobic bacteria, Sewage treatment), Anaerobic processes, Spirillaceae, Reaction kinetics, Acetates, Reviews.
Identifiers: *Methanobacterium.

Conventional wastewater treatment plants generally use an anaerobic digester to stabilize the wastewater settleable solids and the excess microbial solids produced within the plant. The anaerobic fermentation process is very pH dependent. The methane bacteria which are responsible for the final step in the anaerobic fermentation process and are probably responsible for most operational problems as they are considered to be very pH sensitive. Because of this sensitivity, the pH tolerance of the acetate fermenting methane bacteria was investigated using laboratory anaerobic filters. The research involved the following studies: determining what relative rate of methane production can be achieved at various pH levels, determining the effect of the non-optimum pH duration on the fermentation rate, and determining what fermentation recovery time can be expected from non-optimum pH levels and what effect the non-optimum pH duration has on this recovery.

PB-206 238
Minnesota Univ., Minneapolis. Mineral Resources Research Center.
FLOCCULATION AND CLARIFICATION OF MINERAL SUSPENSIONS.
Water Pollution Control Research series.
May 71, 126p W72-04098, EPA-WQO-14010-DRB-05/71

Descriptors: (*Suspended sediments, *Clarification), (*Industrial waste treatment, *Flocculating), Flocculants, Starches, Calcium, Quartz, Iron hydroxides, Polymers, Performance evaluation, Zeta potential, Benefication, Viscosity, pH control, Water pollution, Polyacrylamides.
Identifiers: *Water pollution control, Goethite.

The clarification of plant effluents, particularly those from mineral processing operations, is

becoming of much concern for the prevention of stream and lake pollution. The present study was undertaken in order to examine the mechanism of a combined use of a multivalent cation and a polymeric compound, to arrive at a most effective choice in their use as flocculants for the control of water pollution problems, and to establish the effect of size distribution on floc formation and clarification. For prototype solids, quartz and goethite of several different size distributions were chosen. At the same time they constitute the main components of the ore minerals of immediate interest for the iron ore industry of Minnesota. For flocculants, calcium ion and unmodified corn starch were used mainly because their use is well established. The investigation was later extended to include chemically modified starches and polyelectrolytes.

PB-206 242
National Air Pollution Control Administration, Cincinnati, Ohio. Div. of Air Quality and Emission Data.
DAYTON AIR POLLUTANT EMISSION INVENTORY,
Alan J. Hoffman, and Clyde B. Morita. Nov 68, 51p APTD-0876

Descriptors: (*Air pollution, *Ohio), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Dayton (Ohio), Drake County (Ohio), Miami County (Ohio), Preble County (Ohio), Montgomery County (Ohio).

The report is a compilation of air pollutant emissions in the Dayton, Ohio Metropolitan Area. The objectives of this emission inventory were to determine the quantity of the various air pollutants emitted as well as delineate their geographical and seasonal variations. This was done by using a modified form of the Rapid Survey Technique. The study area was divided into a grid coordinate system, and the emission quantities were reported in terms of tons of pollutants per grid for a summer, winter, and average day. The pollutants considered in this survey were sulfur oxides, particulates, carbon monoxide, hydrocarbons, and oxides of nitrogen.

PB-206 243
National Air Pollution Control Administration, Cincinnati, Ohio. Div. of Air Quality and Emission Data.
BUFFALO AIR POLLUTANT EMISSION INVENTORY,
George M. Duggan, and Jack C. Fensterstock. Dec 68, 50p APTD-0877

Descriptors: (*Air pollution, *New York), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Buffalo (New York), Erie County (New York), Niagara County (New York).

The results of an emission inventory of air pollutant sources in the Buffalo, New York Metropolitan Area is presented. The objectives of the study were to determine the total quantities of the various air pollutants emitted and to estimate their seasonal and geographical variation. The study area was divided into a grid coordinate system, and the emission quantities were reported in terms of tons of pollutant per grid for a summer, winter, and average day. The pollutants considered in this survey were sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides. The source categories considered were fuel combustion in stationery sources, transportation, industrial processes, and solid waste disposal.

PB-206 244
National Air Pollution Control Administration, Cincinnati, Ohio. Div. of Air Quality and Emission Data.
SAN ANTONIO METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Michael J. McGraw. Jun 69, 61p APTD-0885

Descriptors: (*Air pollution, *Texas), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *San Antonio (Texas), Bexar County (Texas), Bandera County (Texas), Guadalupe County (Texas), Atascosa County (Texas), Comal County (Texas), Kendall County (Texas), Mendina County (Texas), Wilson County (Texas).

A report is presented of the emission inventory of the San Antonio, Texas Metropolitan Area. The report provides estimates of total emissions of oxides of sulfur, oxides of nitrogen, hydrocarbons, carbon monoxide, and particulate matter. The emissions of these pollutants are delineated with respect to source type, season of the year and geographical distribution within the area. The following sources are included in the report: fuel combustion, transportation, solid waste disposal, industrial process losses, and evaporative losses.

PB-206 245
National Air Pollution Control Administration, Cincinnati, Ohio. Div. of Air Quality and Emission Data.
SEATTLE-TACOMA AIR POLLUTANT EMISSION INVENTORY,
David V. Mason, and Guntis Ozolins. Dec 68, 84p APTD-0886

Descriptors: (*Air pollution, *Washington (State)), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Tacoma (Washington), *Seattle (Washington), Clallam County (Washington), Jefferson County (Washington), Mason County (Washington), Thurston County (Washington), Pierce County (Washington), King County (Washington), Snohomish County (Washington), Skagit County (Washington), Whatcom County (Washington).

A report is presented of the emission inventory on the Seattle-Tacoma, Washington metropolitan area. The report, which is intended to determine the present level of emissions and status of their control, provides estimates of total emissions of oxides of sulfur oxides of nitrogen, hydrocarbons, carbon monoxide and particulate matter. The emissions are delineated with respect to source type, season of the year, and geographical distribution within the area. The study area is divided into grid zones that serve as the basis for locating sources and reporting their emissions. The inventory included emission sources; fuel combustion, transportation, refuse disposal, and industrial processes.

PB-206 306
Federal Water Quality Administration, Cincinnati, Ohio. Advance Waste Treatment Research Lab.
NITROGEN REMOVAL FROM WASTEWATERS,
F. M. Middleton. May 70, 31p W72-04085, EPA-WQO-17010-05/70

Descriptors: (*Chemical removal (Sewage treatment), *Nitrogen inorganic compounds), (*Water pollution, Nitrogen inorganic compounds), (*Sewage treatment, Nitrogen inorganic compounds), Nitrates, Ammonia, Nitrites, Nutrients, Nitrification, Cost estimates, Biodeterioration, Stripping (Distillation), Ion exchanging.
Identifiers: Denitrification, *Water pollution control.

The various forms in which nitrogen occurs in wastewater, and the equally varied methods used to remove these nitrogen compounds are the subject of the report. The seven papers included provide first a brief review of some possible deleterious effects of nitrogen in the nation's wastewaters in the form of nitrites, nitrates, ammonia, ammonium ion, or dissolved nitrogen gas. Methods of removal which were studied included: Suspended growth biological reactors; Packed column biological reactors; Removal of ammonia nitrogen by air stripping; Removal of ammonia nitrogen by ion exchange; Removal of nitrates by ion exchange; and Miscellaneous other methods for removing various nitrogenous compounds.

PB-206 308
Datagraphics, Inc., Pittsburgh, Pa.
INORGANIC CHEMICALS INDUSTRY PROFILE (UPDATED).
Water Pollution Control Research series.

Jul 71, 227p W72-04099, EPA-12020-EJI-07/71
Prepared in cooperation with Rice (Cyrus Wm.) and Co., Pittsburgh, Pa.
Paper copy available from GPO $1.75 as EP2.10:12020EJI07/71.

Descriptors: (*Industrial waste treatment, *Chemical industry), (*Water pollution, *Industrial wastes), Inorganic chemistry, Cost estimates, Capital costs, Operating costs, Forecasting, Chemical engineering, Injection wells, Sewage treatment, Neutralizing, Chlorine, Pigments, Fertilizers, Insecticides, Explosives, Lagoons (Ponds), Clarification.
Identifiers: *Water pollution control.

The report presents a description of the inorganic chemical industry and the costs that the industry would incur in attaining various levels of pollution abatement over the five-year period through 1974. For the study purposes, the inorganic chemical industry has been defined as including establishments producing alkalies and chlorine, industrial gases, inorganic pigments, paints and allied products, fertilizers (excluding ammonia and urea), inorganic insecticides and herbicides, explosives, and other major industrial inorganic chemicals. The report presents in considerable detail the description of the various production processes, the waste treatment methods practiced, and the possible impact that changes in processes might have on the volume and character of the wastes produced. (Author)

PB-206 309
Bureau of Radiological Health, Rockville, Md. Div. of Electronic Products.
EVALUATION OF THE S. S. WHITE PANOREX (TRADE NAME) X-RAY MACHINE,
Arnold F. Jacobson, and John P. Ferguson. Dec 71, 62p BRH/DEP-72-6 FDA-72-8020
Paper copy available from GPO $0.65 as HE20.4110:72-6.

Descriptors: (*X ray apparatus, *Dental equipment), (*Health physics, X ray apparatus), Performance evaluation, Radiation hazards, Radiological dosage, Radiography, Dentistry.

An evaluation of the S.S. White Panorex dental x-ray machine was performed. The physical and operational characteristics of the unit were investigated with particular emphasis on kVp and mA meter calibrations, focal spot characteristics, x-ray beam dimensions, half-value layers, and in-

herent filtration. Isoexposure curves for radiation in the vicinity of a phantom were determined, and survey techniques for half-value layer measurements and x-ray beam alignment were investigated. Recommendations based on the observed operation of the Panorex are advanced.

PB-206 429
Datagraphics, Inc., Pittsburgh, Pa.
PROJECTED WASTEWATER TREATMENT COSTS IN THE ORGANIC CHEMICAL INDUSTRY.
Water pollution control research series.
Jul 71, 166p EPA-12020-GND-07/71
Prepared in cooperation with Cyrus Wm. Rice and Company, Pittsburgh, Pa.

Descriptors: (*Industrial waste treatment, *Chemical industry), (*Water pollution, *Industrial wastes), Organic chemistry, Cost estimates, Capital costs, Operating costs, Dyes, Pigments, Refineries, Fertilizers, Hydrocarbons, Forecasting, Chemical engineering, Activated sludge process, Lagoons (Ponds), Injection wells.
Identifiers: *Water pollution control.

The report presents a description of the organic chemical industry and the costs the industry would incur in attaining various levels of pollution abatement over the five-year period through 1974. The report presents in considerable detail the description of the various production processes, the waste treatment methods practiced, and the possible impact that changes in processes might have on the volume and character of the wastes produced. (Author)

PB-206 430
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Cincinnati Water Research Lab.
A COMPILATION OF COST INFORMATION FOR CONVENTIONAL AND ADVANCED WASTEWATER TREATMENT PLANTS AND PROCESSES.
Robert Smith. Dec 67, 55p W72-04298, EPA-17090-12/67

Descriptors: (*Sewage treatment, Cost estimates), Activated sludge process, Sewage filtration, Trickling filtration, Sedimentation, Stripping (Distillation), Activated carbon treatment, Electrodialysis, Aeration, Chlorination, Sewer pipes, Capital costs, Design criteria, Operating costs.
Identifiers: Sewage treatment plants, Secondary sewage treatment.

The cost associated with building and operating wastewater treatment plants or individual wastewater processes has always been difficult to estimate for planning purposes. It is hoped that this will prove a useful working document for engineers and scientists working in the field of wastewater treatment. Costs for conventional treatment plants include those for primary sedimentation, activated sludge and trickling filter plants. Advanced treatment processes considered in this collection are: solids removal by coagulation and sedimentation; filtration through sand or graded media; ammonia stripping, granular carbon adsorption; electrodialysis, microstraining of secondary effluent; aeration of secondary effluent; chlorination of secondary effluent; and pipelines for ultimate disposal. Also, added are construction costs for individual equipment, structures and consumable items.

PB-206 469
National Air Pollution Control Administration, Cincinnati, Ohio. Div. of Air Quality and Emission Data.
AIR POLLUTANT EMISSION INVENTORY FOR MEMPHIS METROPOLITAN AREA,
Michael J. McGraw. Sep 69, 57p APTD-0882

Descriptors: (*Air pollution, *Tennessee), Mississippi, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Memphis (Tennessee), Crittenden County (Tennessee), Shelby County (Tennessee), Desoto County (Mississippi).

A report of the emissions inventory of the Memphis, Tennessee Metropolitan Area is presented. The survey was intended to determine the present level of emissions and status of their control. Estimates are provided of total emissions of oxides of sulfur, oxides of nitrogen, hydrocarbons, carbon monoxide and particulate matter. The emissions are delineated with respect to source type, season of the year, and geographical distribution within the area. The report included the following sources: fuel combustion, transportation, solid waste disposal, industrial process losses, and evaporative losses. (Author)

PB-206 472
Onondaga County, Syracuse, N. Y.
ONONDAGA LAKE STUDY.
Water pollution control research series.

Apr 71, 485p W72-04277, EPA-11060-FAE-04/71
Paper copy available from GPO $4.50 as stock no. 5501-0099.

Descriptors: (*Water pollution, *Lakes), Water quality, Sewage, Limnology, Temperature, Water chemistry, Chlorides, Calcium, Aquatic biology, Fishes, Plankton, Stratification, Benthos, Monitors, Trace elements, New York.
Identifiers: *Onodaga Lake, Eutrophication.

The study was conducted to appraise the trophic status of the saline Onondaga Lake, Onondaga County, New York, and to estimate the effects of the proposed waste treatment plant. The determined parameters included circulation patterns, distribution of chemical constituents, and the biotic contents of the lake. Mineral-water equilibria showed an uninterrupted and a widely distributed formation of phosphate-bearing minerals. The predominant component of lake sediments is calcium. The salinity of lake water did not preclude occurrence of a wide variety of phytoplankton, zooplankton, and fish. Proposed waste treatments should significantly increase the supply of dissolved oxygen and lower the phosphorus concentration.

PB-206 473
Heidelberg Coll., Tiffin, Ohio. Dept. of Biology.
WATER QUALITY CONTROL THROUGH FLOW AUGMENTATION.
Water pollution control research series,
David B. Baker, and Jack W. Kramer. Jan 71, 162p W72-04260, EPA-WQO-16080-DFO-01/71
Paper copy available from GPO $1.50 as EP2.10:16080DFO01/71.

Descriptors: (*Water quality, *Stream flow), (*Water pollution, Stream flow), Limnology, Fluorides, Calcium, Magnesium, Sodium, Phosphorus inorganic compounds, Nitrates, Dissolved gases, Oxygen, Algae, Ohio.
Identifiers: Sandusky River.

A 60-mile section of the Sandusky River, Ohio, was investigated to evaluate the relationship between the volume and the quality of flowing water. The content of fluoride, calcium, magnesium, and sodium were directly and those of total and soluble phosphorus indirectly related to the flow volume. No correlation was observed between the flow and concentration of either potassium or nitrates. Oxygen content was high at an abundant flow, but showed considerable variation, being influenced by respiration of algae. The study suggested that an increased current velocity reduces the density of algal population. (Author)

PB-206 476
World Life Research Inst., Colton, Calif.
PHARMACOLOGICAL TESTING OF BLUE--GREEN ALGAE FOR CONSTITUENTS HAVING THERAPEUTIC VALUE.
Water pollution control Research series,
Bruce W. Halstead. Jun 70, 20p W72-04259, EPA-WQO-160010-DOU-06/70
Contract FWQA-14-12-535
Paper copy available from GPO $0.30 as stock no. 5501-0123, EP.2.10:16010DOU06/70.

Descriptors: (*Algae, *Pharmacology), (*Cyanophyta, Pharmacology), Chemotherapeutic agents, Pathology, Toxicity, Antineoplastic agents, Antiinfectives and antibacterials, Tests, Lakes, Oregon.
Identifiers: Aphanizomenon flos aquae.

The objectives of this contract were to determine if the phytochemical constituents of Aphanizomenon flos-aquae from Upper Klamath Lake, Oregon, contained pharmacological properties that might have potential pharmaceutical value as a therapeutic agent. (Author)

PB-206 538
Pacific Northwest Water Lab., Corvallis, Oreg.
ENVIRONMENTAL REQUIREMENTS OF BLUE-GREEN ALGAE.

Oct 67, 114p W69-03512, FWPCA-16010-10/67
Proceedings of a Symposium held 23-24 Sep 66. Sponsored in part by Washington Univ., Seattle.

Descriptors: (*Water pollution, Algae), (*Algae, *Limnology), (*Cyanophyta, Limnology), Nutrients, Aquatic biology, Plant physiology, Temperature, Nitrates, Phosphates, Meetings, Ecology.
Identifiers: *Eutrophication.

The problem of accelerated eutrophication has many facets, and some are being examined through research to find the keys for solution. The symposium was held to fulfill the need to understand better the environmental requirements of blue-green algae. The subjects include: Problems in the laboratory culture of planktonic blue-green algae; Aspects of the nitrogen nutrition of some blue-green algae; Environmental requirements of thermophilic blue-green algae; Growth requirements of blue-green algae as deduced from their natural distribution; Physiology of blue-green algae.

PB-206 543
Pacific Northwest Water Lab., Corvallis, Oreg.
INDEX TO RESEARCH ON COASTAL AND ESTUARINE WATERS IN THE UNITED STATES,
George R. Ditsworth. Sep 67, 37p W72-04209, FWPCA-16070-09/67

Descriptors: (*Estuaries, Research projects), (*Coasts, Research projects), (*Water pollution, Research projects), Project planning, Water treatment, Waste disposal, Indexes, Marine biology, Research management, Marine geology, Water chemistry, United States.
Identifiers: Marine environment.

The index describes more than 250 research projects on coastal and estuarine waters of the United States that were in progress during 1966 or are planned for the near future by governmental, academic, and private facilities. The projects encompass biological, chemical, geological, and physical aspects of the marine environment. The following information is listed for each project: (1) project title; (2) state where research is conducted or the state from which the study is conducted; (3) university or agency conducting the research; (4) principal investigator (s) and (5) the information source. Projects are grouped according to four coastal regions: Pacific Coast (California to Alaska), Gulf Coast (Texas to Florida), South Atlantic Coast (Georgia to Maryland), and North Atlantic Coast (Delaware to Maine). (Author)

PB-206 585
California Univ., Davis. Dept. of Agricultural Engineering.
SOLID WASTES MANAGEMENT IN GERMANY. REPORT OF THE U.S. SOLID WASTES STUDY TEAM VISIT. 25 JUNE-8 JULY 1967,
Samuel A. Hart. 1968, 26p EPA-SW-2-68
Library of Congress Catalog Card no. 68-62432.

Descriptors: (*Refuse disposal, *West Germany), Evaluation, Comparison, Earthfills, Composts, Incinerators, Economic analysis.
Identifiers: *Solid waste disposal, Sanitary landfills.

In 1967, a nine-member team of scientists and engineers sponsored by the federal solid wastes program investigated domestic refuse management practices in Germany. The trip was designed to evaluate the possibilities of applying German technology to U.S. needs and to encourage mutual information exchange between the two countries. The common disposal methods--landfilling, composting, and incineration--were observed and compared to similar operations in the United States. Economic, political, and philosophic differences between the two countries were shown in the dissimilar characteristics of the solid wastes and in the emphasis placed on certain management practices. (Author)

PB-206 693
URS Research Co., San Mateo, Calif.
EVALUATION OF SELECTED EARTHMOVING EQUIPMENT FOR THE RESTORATION OF OIL-CONTAMINATED BEACHES.
Water pollution control research series, 29 Aug 69-1 Jul 70.

Oct 70, 174p W72-04296, EPA-15080-EOS-10/70
Paper copy available from GPO $1.50 as EP2.10:15080EOS10/70-1.

Descriptors: (*Water pollution, Oils), (*Beaches, *Cleaning), (*Earth handling equipment, Cleaning), Field tests, Performance evaluation, Operating costs, Cost estimates, Straw, Scrapers, Graders, Front end loaders, Conveyors.
Identifiers: *Oil pollution removal, Oil pollution.

Field studies of earthmoving equipment units were conducted to evaluate their use and effectiveness in restoring oil contaminated beaches. Specifically, operating procedures and cost estimates were desired, along with any useful design modifications. Previous beach restoration operations were reviewed prior to initiation of the field tests for information about the type of performance required. The field tests were then performed on each equipment/procedure unit to determine efficiency, flexibility, and performance characteristics under a variety of field conditions. Oil removal effectiveness was greater than 98% for all restoration procedures, with the highest effectiveness being achieved by a motorized grader and a motorized elevating scraper working in combination. Conveyor screening systems can be effectively utilized. Costs for removal are reported. (Author)

PB-206 717
Bolt Beranek and Newman, Inc., Cambridge, Mass.
NOISE FROM CONSTRUCTION EQUIPMENT AND OPERATIONS, BUILDING EQUIPMENT, AND HOME APPLIANCES.

31 Dec 71, 337p* EPA-NTID300.1
Contract EPA-68-04-0047

Descriptors: (*Noise (Sound), *Pollution), Noise reduction, Construction equipment, Houses, Residential buildings, Industrial plants, Sources, Household goods, Loudness, Auditory perception, Sources, Exposure, Abatement, Acoustic insulation.
Identifiers: *Noise pollution, Household appliances, *Noise exposure.

Given that noise is a serious environmental problem, some appropriate questions one might ask in seeking a comprehensive noise-control objective are: Precisely what are the sources of noise pollution. How many people are exposed to these sources and how are they affected. What can be done to control the noise output of offending sources. The report attempts to answer these questions for the specific categories of construction, home appliances, and building equipment. (Author)

PB-206 721
Informatics, Inc., Bethesda, Md.
AN ASSESSMENT OF NOISE CONCERN IN OTHER NATIONS. VOLUME I,

31 Dec 71, 497p* EPA-NTID300.6-Vol-1
Contract EPA-68-01-0157
See also Volume 2, PB-206 722. 23 (*Noise (Sound), *Pollution), (*Foreign government, Noise (Sound)), Noise reduction, Urban areas, Transportation, Airports, Public health, Abatement, Organizations, Exposure, Law (Jurisprudence), Acoustic insulation, Australia, Austria, West Germany, East Germany, France, Japan, Great Britain, Israel, Italy, Switzerland, USSR, Yugoslavia.
Identifiers: *Noise pollution, Noise exposure.

The report presents an overview of noise abatement and control problems and activities of foreign nations. It is presented on the premises that the issue of noise and its effect on man has attracted worldwide attention. The areas primarily discussed are noise in the community, air traffic noise, surface traffic noise, industrial noise, significant foreign noise-related organizations, and laws.

PB-206 722
Informatics, Inc., Bethesda, Md.
AN ASSESSMENT OF NOISE CONCERN IN OTHER NATIONS. VOLUME II.

31 Dec 71, 51p* EPA-NTID300.6-Vol-2
Contract EPA-68-01-0157
See also Volume 1, PB-206 721.

Descriptors: (*Noise (Sound), *Physiological effects), (*Auditory perception, Noise (Sound)), Reviews, Exposure, Pathology, Stress (Physiology), Public health, Pollution, Humans, Animals.
Identifiers: *Noise pollution, *Noise exposure.

The report gives a brief review of a few foreign research efforts on noise exposure. This includes for example, the study of extra-aural effects of noise on an organism, theories of psychology of noise, research on the existence of the noise syndrome, and the pathogenis of noise.

PB-206 724
National Bureau of Standards, Washington, D.C.
THE SOCIAL IMPACT OF NOISE.

31 Dec 71, 25p* EPA-NTID300.11

Descriptors: (*Noise, *Sociology), (*Public health, Noise), Urban areas, Transportation, Construction, Communities, Adaptation, Stress (Physiology), Stress (Psychology), Industrial hygiene.
Identifiers: *Noise pollution.

The World Health Organization defines health as a state of physical, mental, and social well being and not merely the absence of disease or infirmity. Using this definition it is evident that noise can be considered as having an important influence on the health of man. Because of its pervasive influence in all settings, activities and walks of life it has been often cited as a major source of annoyance as well as a threat to physical and mental health. For most people the usual consequences of noise are associated with interference with listening to speech or other sounds, distraction at home and on the job, disturbance of rest and sleep, and disruption of recreational pursuits. All of the foregoing can be considered components of the quality of life. In dealing with the social impact of noise, this report is divided into several sections: Overview; Extent of problem -- changing scope of problem; Effects of noise -- medical, psychological, social.

PB-206 734
Environmental Research Labs., Boulder, Colo.
REMOTE SENSING OF POLLUTANTS.
Annual rept.,
R. L. Schwiesow. 30 Jun 71, 53p APTD-0891

Descriptors: (*Air pollution, *Infrared spectroscopy), Carbon monoxide, Sulfur dioxide, Hydrogen chloride, Ozone, Nitric acid, Ammonia, Data processing, Computer programs, Remote sensing, Fluorescence, Infrared spectra, Optical radar, Light scattering.
Identifiers: *Air pollution detection.

Research results obtained during FY 71 are summarized on quantitative infrared spectra of pollutant gases such as CO, O3, HCl, SO2, NH3, and HNO3; on analyzing long path infrared spectra by digital means for atmospheric gas concentrations; on scattering cross section measurements for SO2 and NO; and on literature search and consultative services in atmospheric spectroscopy. Explanations and reviews of the particular results are illustrated by samples of the voluminous transmission tables and graphs supplied separately. The developed information is crucial for proper interpretation of remote sensing field measurements of pollutant concentrations in both source and ambient situations. (Author)

PB-206 757
National Air Pollution Control Administration, Durham, N.C. Air Quality and Emission Data Program.
DENVER AIR POLLUTANT EMISSION INVENTORY,
Clyde Morita, Guntis Ozolins, and George Duggan. Aug 68, 44p APTD-0880

Descriptors: (*Air pollution, *Colorado), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Evaporation, Waste disposal, Demography, Transportation, Industrial wastes.
Identifiers: *Air quality data, *Denver (Colorado), Adams County (Colorado), Arapaho County (Colorado), Boulder County (Colorado), Denver County (Colorado), Jefferson County (Colorado), Larimer County (Colorado), Weld County (Colorado).

A rapid emission inventory of air pollutant sources in the Denver metropolitan area is reported. The objectives were to determine the total quantities of various air pollutants emitted and to estimate their geographical and seasonal variation. The study area was divided into a grid coordinate system and the emission quantities were reported in terms of tons of pollutant per grid on an average annual day, average summer day, and average winter day. Sulfur oxides, particulates, and carbon monoxide were included. (Author)

PB-206 794
San Buenaventura, Calif.
INTEGRATED ACTIVATED SLUDGE BIOLOGICAL FILTER PROCESS.
Water pollution control series.

Mar 71, 50p W72-04558, EPA-WQO-17050-EEO-03/71
Grant WPRD-2-01-67

Descriptors: (*Activated sludge process, *Trickling filtration), (*Sewage treatment, Activated sludge process), Sewage filtration, Pilot plants, Performance evaluation, Sanitary engineering, Design criteria.

A 75,000-gallon per day pilot plant was constructed to evaluate the feasibility of treating domestic wastewaters by combining the two established processes of trickling filtration and complete mixed activated sludge. The most promising process was primary sedimentation, trickling filter, activated sludge, and final sedimentation. (Author)

PB-206 797
Federal Water Quality Administration, Edison, N.J. Water Quality Lab.
OIL SPILL CONTAINMENT SYSTEMS.
Oct 70, 140p* W72-04826, FWQA-15080-10/70

Descriptors: (*Water pollution, Oils), (*Booms (Equipment), Water pollution), Reviews, Barriers, Cost estimates, Design criteria.
Identifiers: Oil pollution, *Oil pollution containment, *Oil retention booms.

A wide variety of devices have been designed to prevent the spread of oil slicks over wide areas. An attempt was made to include a description of all of the various types of barriers currently in the published literature, under patent application, in the final stages of development, and those available as full scale commercial equipment today. Performance data, when documented by reliable and competent personnel, are also included. The containment systems listed may be broadly generalized into the following types: commercial floating booms, improvised booms, and air barriers. More than 50 approaches to the problem are encompassed in the report, although many more systems are possible. (Author)

PB-206 807
TRACOR, Inc., Austin, Tex.
ESTUARINE MODELING: AN ASSESSMENT.
Water pollution control research series,
George H. Ward, Jr., and William H. Espey, Jr.
Feb 71, 517p W72-04555, EPA-WQO-16070-DZV-02/71
Contract FWPA-14-12-551
Paper copy available from GPO $4.50 as stock no. 5501-0129 EP2.10:16070DZV02/71.

Descriptors: (*Estuaries, Mathematical models), (*Water pollution, Estuaries), Reviews, Hydraulic models, Water quality, Temperature gradients, Aquatic biology, Hydrodynamics, Water chemistry, Mixing, Tidal currents, Water flow, Limnology.
Identifiers: Thames River, Delaware River, San Francisco Bay, Galveston Bay.

A technical review and critical appraisal are presented of present techniques of water quality modeling as applied to estuaries. Various aspects of estuarine modeling are treated by a selection of scientists and engineers eminent in the field, and these essays are supplemented by discussions from technical conferences held during the course of the report's preparation. Topics discussed include mathematical models for estuarine hydrodynamics, water quality models of chemical and biological constituents, models of estuarine temperature structure, and the use of physical models in estuarine analysis. Also included is a review of solution techniques, viz. analog, digital and hybrid, a brief survey of estuarine biota and biological modeling, and a collection of case studies reviewing several estuarine modeling projects. (Author)

PB-206 808
Colorado State Univ., Fort Collins.
WATER POLLUTION POTENTIAL OF SPENT OIL SHALE RESIDUES.
Water pollution control series.

Dec 71, 119p W72-04556, EPA-14030-EDB-12/71
Paper copy available from GPO $1.25 as EP2.10:14030EDB12/71.

Descriptors: (*Oil shale, Soil erosion), (*Soil erosion, Water pollution), (*Tailings, *Surface water runoff), Water erosion, Rain, Leaching, Sulfates, Sodium sulfates, Computer programming.

Physical properties, including porosity, permeability, particle size distribution, and density of spent shale from three different retorting operations, have been determined. Slurry experiments were conducted on each of the spent shales and the slurry analyzed for leachable dissolved solids. The concentrations of the various ionic species in the initial leachate from the column were high. The major constituents, SO4 (-2) and Na (+), were present in concentrations of 90,000 and 35,000 mg/l in the initial leachate; however the succeeding concentrations dropped markedly during the course of the experiment. A computer program was utilized to predict equilibrium concentrations in the leachate from the column. The extent of leaching and erosion of spent shale, and the composition and concentration of natural drainage from spent shale has been determined using oil shale residue and simulated rainfall. Concentrations in the runoff from spent shale have been correlated with runoff from the spent shale have been correlated with runoff rate, precipitation intensity, flow depth, application time, slope, and water temperature. (Author)

PB-206 810
California Univ., Berkeley. Sanitary Engineering Research Lab.
KINETICS OF ALGAL SYSTEMS IN WASTE TREATMENT. PHOSPHORUS AS A GROWTH--LIMITING FACTOR.
Final rept. (Part I),
Mario D. Zabat, William J. Oswald, Clarence G. Golueke, and Henry Gee. Sep 70, 210p W72-04788, FWQA-17010-DZQ-09/70
See also Part 2, PB-206 811.

Descriptors: (*Nutrients, Chemical removal (Sewage treatment)), (*Phosphorus inorganic compounds, Chemical removal (Sewage treatment)), (*Algae, *Sewage treatment), (*Water pollution, *Nutrients), Chlorella, Plant growth, pH control, Sources, Sewage treatment, Reviews, Metabolism, Limnology, Temperature control, Process variables.
Identifiers: *Eutrophication, Chlorella pyrenoidosa.

The kinetics and characteristics of phosphate-limited algal cultures were studied on a laboratory scale in order to: Evaluate kinetic parameters of algal growth in relation to phosphorus concentration; Derive an expression describing the growth rate-limiting nutrient relationship; and Determine desirable or optimum design and operating parameters for effective phosphorus removal by algal systems. Phosphorus limiting algal growth was described by the Monod growth model for specific growth rate. Maximum specific growth rate for the algae tested was 4.19/day, and all growth characteristics were significantly affected by variations in pH and temperature of the culture. Removals of moderate concentrations of phosphorus in excess of 85% can be accomplished by continuous algal cultures. (Author)

PB-206 811
California Univ., Berkeley. Sanitary Engineering Research Lab.
KINETICS OF ALGAL SYSTEMS IN WASTE TREATMENT. AMMONIA-NITROGEN AS A GROWTH-LIMITING FACTOR AND OTHER PERTINENT TOPICS.
Final rept. (Part II),
Gedalia Shelef, Joel C. Goldman, William J. Oswald, Mark Sobsey, and Joan E. Harrison. Sep 70, 156p W72-04787, FWQA-17010-DZQ-09/70
See also Part 1, PB-206 810.

Descriptors: (*Algae, *Sewage treatment), (*Nitrogen inorganic compounds, Chemical removal (Sewage treatment)), (*Nutrients, *Chemical removal (Sewage treatment)), Phosphorus inorganic compounds, Nitrogen inorganic compounds, Plant growth, Ammonia, Process variables, Design criteria, pH control, Temperature control, Computer programs, Industrial plants.
Identifiers: Potamocypris.

Four small outdoor reactors, a predator infested outdoor pond, and numerous indoor systems were designed, constructed and operated to provide data describing the kinetics aspects of algal systems used as wastewater treatment schemes. The studies included determinations of: The kinetics of ammonia-nitrogen as a growth limiting factor; The effect of nutrients in wastewater effluents on algal growth; Suggested designs for both indoor and outdoor growth reactors; and Predator-prey relationships in outdoor algal systems. Specific growth rate data for nitrogen were quite consistent, allowing the use of the maximum specific net growth rate as an extremely reliable parameter of system operation. Other studies demonstrated that permissible dilution ratios for waste water discharges into receiving waters can be formulated empirically. Design and operational information of various systems is presented, as well as preliminary bioassay results on the microbial populations of algal ponds. (Author)

PB-206 812
California Univ., Berkeley. Sanitary Engineering Research Lab.
KINETICS OF ALGAL SYSTEMS IN WASTE TREATMENT. FIELD STUDIES.
Final rept. (Part III),
Aaron Meron, William J. Oswald, and Henry K. Gee. May 71, 334p W72-04789, FWQA-17010-DZQ-05/71
See also Part 2, PB-206 811.

Descriptors: (*Algae, *Sewage treatment), (*Nutrients, *Chemical removal (Sewage treatment)), (*Lagoons (Ponds), Sewage treatment), Limnology, Phosphorus inorganic compounds, Nitrogen inorganic compounds, Design criteria, Anaerobic processes, Process variables, pH control, Biochemical oxygen demand, Plant growth, Design criteria.

Three domestic sewage stabilization pond systems were studied to evaluate the relationship between design criteria and performance criteria for pond systems in accomplishing specific waste treatment steps. One system consisted of a lined high-rate pond following sedimentation, another was comprised of conventional secondary waste treatment followed by a pond system, and the last consisted solely of several deep ponds in series. Study results indicated that the last system, consisting of an anaerobic pond, an unlined high rate pond, and deep high-rate polishing pond, was effective in both BOD and nutrient removals, with mean annual removals of 97.3%, 93.2%, 91.6%, and 64.5% for BOD, COD, total nitrogen, and phosphate. Results confirmed that pond functioning is determined by position with respect to other ponds and unit processes, as well as their individual design characteristics. (Author)

PB-206 814
Portland Dept. of Public Works, Oreg. Bureau of Sanitary Engineering.
DEMONSTRATION OF ROTARY SCREENING FOR COMBINED SEWER OVERFLOWS.
Jul 71, 58p W72-04827, EPA-11023-FDD-07/71
Contract EPA-14-12-128
Paper copy available from GPO $0.65 as EP2.10:11023-FDD-07/71.

Descriptors: (*Storm sewers, *Sizing screens), Surface water runoff, Filtration, Waste water, Water quality, Durability, Water treatment, Biochemical oxygen demand, Maintenance, Service life, Efficiency.
Identifiers: *Rotary screening, Combined sewer overflows.

A 60 inch diameter rotating screen cage was subjected to various combinations of rotational speeds and wastewater flows to determine screen durability, solids removal, COD removal, and hydraulic efficiency of rotary fine screening of storm-caused combined sewer overflows. During a screening cycle, a concentr[illegible] sensor stopped the sewage pumps, ending the screening phase and initiating a 30 second washing phase during which the screens were automatically washed. (Author)

PB-206 815
Pacific Northwest Water Lab., Corvallis, Oreg.
GUIDELINES: BIOLOGICAL SURVEYS AT PROPOSED HEAT DISCHARGE SITES,
Ronald R. Garton, and Ralph D. Harkins. Apr 70, 111p W72-04828, EPA-WQO-16130-04/70
Prepared in cooperation with Robert S. Kerr Water Research Center, Ada, Oklahoma.
Paper copy available from GPO$1.00 as EP2.10:16130-04/70.

Descriptors: (*Water pollution, Heat), (*Aquatic biology, Heat), (*Limnology, Heat), Fishes, Zooplankton, Phytoplankton, Ecology, Statistical analysis, Sampling, Electric power plants.
Identifiers: *Water pollution effects (Animals), *Thermal pollution.

A quantitative approach is presented for the biological portion of thermal discharge siting surveys and discharge monitoring. Three types of studies are covered: A very general study of the aquatic system and the pertinent literature; A comprehensive pre-operational study designed to supply data for management decisions on power plant siting and data to serve as baseline for possible future comparison; and A post-operational continuation to detect possible effects if a thermal discharge to a natural water body is allowed. Two methods are recommended for location of sampling stations by use of a grid system based on planned outfall design. Sample collection and handling methods and frequency of sampling are suggested for fish, macroinvertebrates, plankton, periphyton and aquatic macrophytes. Methods of data handling recommended include diversity and redundancy indices and a combination of the two into one value for a test for dispersion. A scale of importance is suggested for organisms of special value in either an economic or ecologic sense. (Author)

PB-206 816
Dynatech Corp., Cambridge, Mass.
A SURVEY OF ALTERNATE METHODS FOR COOLING CONDENSER DISCHARGE WATER. TOTAL COMMUNITY CONSIDERATIONS IN THE UTILIZATION OF REJECTED HEAT.
Water pollution control research series.

Nov 70, 62p W72-04830, EPA-16130-DHS-11/70
Contract EPA-12-14-477
Revision of report dated Jun 70.
Paper copy available from GPO $0.65 as EP2.10:16130DHS11/70.

Descriptors: (*Heat recovery, *Electric power generation), (*Water pollution, Heat), Utilization, Heating equipment, Thermodynamics, Feasibility, Irrigation, Desalting, Sewage treatment, Aquaculture, Abatement.
Identifiers: *Thermal pollution.

The quantities of electric energy consumption and associated heat rejection quantities, their present and projected allocation throughout the different sections of the country, and their relation to other forms of energy consumption are reviewed and tabulated. Thermodynamic constraints on a solution to the thermal pollution problem are defined. Feasibility of possible application of waste heat usage are reviewed in the field of heating and air-conditioning, aquaculture, process industry, irrigation, sewage treatment, desalination, snow or ice melting and integration with municipal water system. (Rainwater-EPA)

PB-206 817
Littleton Research and Engineering Corp., Mass.
AN ENGINEERING - ECONOMIC STUDY OF COOLING POND PERFORMANCE.
Water pollution control research series.

May 70, 179p W72-04831, EPA-16130-DFX-05/70
Contract EPA-14-12-521
Paper copy available from GPO $1.50 as EP2.10:16130DFX05/70.

Descriptors: (*Lagoons (Ponds), *Cooling water), (*Economic analysis, Cooling water), (*Electric power plants, Lagoons (Ponds)), Heat, Temperature control, Capital costs, Heat transfer, Performance evaluation, Design criteria, Evaporative cooling, Heat budget, Water pollution.
Identifiers: *Cooling ponds, *Thermal pollution.

A procedure for predicting the temperature of a thermally loaded captive pond is presented. Using this information, the cooling pond is shown in a special case to have an economic advantage over a cooling tower and to be not much more expensive than a natural body (stream or ocean) of water. This, with the ecological and recreational assets of a captive cooling pond, would seem to encourage their expanded use with large thermo-electric power plants. (Author)

PB-206 820
New York Univ., N.Y. Research Div.
SMOKE CURVE CALIBRATION,
William T. Ingram. Mar 69, 81p APTD-0928
Contract PH-86-68-66

Descriptors: (*Air pollution, *Particles), (*Smoke, Measurement), United States, Great Britain, Gravimeters, Optical reflectometers, Optical spectrometers, Density (Mass/volume), Particle size, Calibrating, Humidity, Light transmission.
Identifiers: *Air pollution detection, International smoke curve.

The report reviews briefly the background and development of particulate density measurement systems in the United States and Great Britain and discusses the difference in reporting units which has made it impossible, from routine reporting, to make comparisons of particulate density concentrations in the atmosphere between locations in the U. S., using either gravimetric measurement or light reflection techniques, and locations in Great Britain using the International Smoke Curve for estimating concentration. Procedures for the establishment of a relationship between United States reporting units (COh/1000 ft.) and British equivalent units (microgram/cu meter) have been developed and are described in detail. An exploratory study was made for the purpose of investigating possible relationships between particle count differentiated by size range and particulate density in terms of light transmittance and/or light reflectance. (Author)

PB-206 821
Tennessee Valley Authority, Muscle Shoals, Ala. Div. of Environmental Research and Development.
FULL-SCALE STUDY OF PLUME RISE AT LARGE ELECTRIC GENERATING STATIONS. BULL RUN SUPPLEMENT,
Thomas L. Montgomery, and S. B. Carpenter. Oct 71, 67p APTD-0934

Descriptors: (*Plumes, *Atmospheric motion), (*Electric power plants, Air pollution), Design criteria, Flue gases, Chimneys, Meteorological data, Wind (Meteorology), Atmospheric diffusion.

The purpose was to develop a practical, data-based procedure for estimating effective plume rise and plume rise versus distance from a large coal-fired power plants. The results are presented of an investigation of the relationships of the meteorological, plant design, and operating conditions to the: initial plume rise within 152 meters from the source; rate of plume rise with downwind distance; and distance where the maximum rise occurs. More than 1,100 photographs were used in this evaluation, incorporating special methods. For a known stability range, an expression may be determined for estimating the effective plume rise at various distances from the stack. An equation for estimating the effective plume rise at any downwind distance up to 3,000 meters during neutral conditions, stable conditions, and very stable conditions is determined. For a selected downwind distance, an expression is determined for estimating the effective plume rise during any stability conditions. (Author)

PB-206 822
Flow Labs., Inc., Rockville, Md.
COMPLEMENT FIXATION, HEMAGGLUTINATION-INHIBITION, AND TRYPSIN INHIBITORY CAPACITY TESTING OF HUMAN SERA.
Final rept. 2 Mar 71-1 Mar 72,
James K. Noel. 2 Feb 72, 114p APTD-0925
Contract EPA-68-02-0032

Descriptors: (*Influenza virus, *Serology), Immunology, Antigens, Antibodies, Blood serum, Humans, Antigen antibody reactions.
Identifiers: Complement fixation tests, Hemogglutination inhibition tests.

The overall objectives were to carry out 3,000 complement fixation and hemagglutination-inhibition tests on human sera. The four antigens were: Flu A-2/Japan; Flu A-2/Hong Kong/68; Flu B/Maryland; and Flu B/Massachusetts. A total of 3,170 serum samples were each tested with the four Flu antigens. In all tests performed, exactly 4 units of each antigen were used and serum controls were satisfactory. All HAI results are tabulated as the reciprocal of the highest serum dilution which completely inhibited agglutination. The complement fixation (CF) test was performed utilizing Influenza Group A and B soluble antigens. A total of 3,063 serum specimens were tested. All CF results are tablated together with the HAI results. (Author)

PB-206 823
Research Corp. of New England, Hartford, Conn.
SPACE AND TIME VARIABILITY OF SO2 AND PARTICULATE CONCENTRATIONS IN CONNECTICUT,
Norman E. Bowne. Sep 71, 65p APTD-0929
Contract CPA-70-155

Descriptors: (*Connecticut, Air pollution), (*Air pollution, *Atmospheric composition), (*Sulfur dioxide, Air pollution), (*Particulate, Air pollution), Urban areas, Rural areas, Atmospheric diffusion, Diurnal variations, Gas sampling, Statistical analysis, Concentration (Composition).
Identifiers: *Air pollution sampling, Air quality data.

The broad objective was to determine the space and time variability of air quality, on time scales two hours or longer and on a minimum space scale of 5000 feet square in urban, suburban and rural locations and to relate this to the use of monitoring and models in tactical and strategic air quality operations. The state of Connecticut was used for the study. An attempt is made to determine how great a bias might be introduced by improper sampling procedures. Estimates of SO2 concentration were made by two models for four selected areas of the state. Frequency distributions were prepared and the observed data were log-normal. Spatial distributions of air quality model estimates were examined in three regions, one of which was actually a double region in the eastern portion of the state for both models. Modeling for both short and long-term concentration estimates can be performed but it is very clear that a good source inventory is required. This is especially important for short-term models. (Author)

PB-206 881
National Environmental Research Center, Research Triangle Park, N.C.
SELECTED STUDIES ON ALKALINE ADDITIVES. SULFUR DIOXIDE CONTROL.
R. H. Borgwardt, D. C. Drehmel, T. A. Kittleman, D. R. Mayfield, and J. S. Bowen. Dec 71, 253p* APTD-0737

Descriptors: (*Air pollution, Sulfur dioxide), (*Limestone, *Adsorbents), (*Sulfur dioxide, *Adsorption), (*Furnaces, *Air pollution control equipment), Reaction kinetics, Calcium oxides, Carbonates, Injection, Boilers, Flue gases, Additives, Particle size, Sulfates, Electric power plants, Scrubbers, Copper oxides, Dolomite (Rock), Calcines, Geological surveys, Roasting.
Identifiers: *Air pollution control.

Concentrated on limestone-sulfur dioxide (SO2) reactions, alkaline additives research has defined the kinetics and capacity as well as the effects of overburning. The kinetics of SO2 sorption by limestone calcines has been determined with a high temperature differential bed gas solids contactor. The effects of particle size, percent conversion of CaO, sulfate loading, pore size, surface area, and geological type of carbonate rock were investigated. The loss of reactivity due to overburning was studied using an oil fired boiler belonging to a power company. Eighty-six carbonate rock samples were tested in a fixed-bed reactor to determine their capacity to react with flue gas containing sulfur dioxide. Although most of the work was performed with the carbonate and the oxide at standard test conditions, supplementary tests were made on hydrates, oxides and carbonates over a wide range of reaction temperatures and calcination conditions. (Author)

PB-206 901
National Environmental Research Center, Cincinnati, Ohio. Analytical Quality Control Lab.
METHOD SELECTION STUDY I. A COMPARISON OF THREE MODIFICATIONS OF THE SINGLE REAGENT METHOD FOR SOLUBLE ORTHOPHOSPHATE.
Final rept.,
John A. Winter, and Robert L. Booth. Apr 69, 43p EPA-16020-M-01

Descriptors: (*Phosphates, *Colorimetric analysis), (*Water analysis, Phosphates), Chi square test, Phosphorus inorganic compounds, Quantitative analysis.
Identifiers: Water pollution detection.

Quantitative analytical recoveries of soluble orthophosphate added to distilled and natural water samples at the 0.2 mg P/l level were compared using modifications of the mixed reagent method suggested by Edwards, Molof, and Schneeman, and Murphy and Riley. The method of Murphy and Riley was shown to have the best precision and accuracy and the least bias. It is selected as the FWPCA Interim Official Method. (Author)

PB-206 906
Environmental Protection Agency, Chicago, Ill. Water Quality Office.
AGRICULTURAL POLLUTION OF THE GREAT LAKES BASIN.

1 Jul 71, 186p W72-04762, EPA-13020-07-71
Combined report by Canada and the United States.
Paper copy available from GPO $1.50 as stock no. 5501-0134, EP2.10:13020-07/71.

Descriptors: (*Water pollution, *Surface water runoff), (*Fertilizers, Water pollution), (*Pesticides, Water pollution), (*Agricultural wastes, Water pollution), (*Great Lakes, Water pollution), Land use, Farm land, Livestock, Nutrients, Soil erosion, Suspended sediments, Forest land, Surface mining, Government policies, United States, Canada, Nitrogen inorganic compounds, Phosphorus inorganic compounds, Organic wastes.
Identifiers: Feedlot wastes, Manure, Eutrophication.

The report concerns pollution abatement in the Great Lakes Basin, specifically influenced by agricultural and related sources, including runoff and release of nutrients, pesticides, herbicides, and degradation by-products as affected by agricultural chemicals, runoff from animal and poultry production, and sedimentation. Current planning, advisory and regulatory functions of the two Governments is discussed. Some basic research of the joint study-group is summarized. Improper manure spreading or storing, and runoff from livestock feeding areas have the greatest potential impact on water quality. Pesticide contribution to environmental contamination is receiving closer scrutiny. The erosion problem is measured in sediment load in streams and deposition rate in reservoirs. High chloride levels, measured in tributary waters, seem related to road salt application. The adequacy of current legislation is discussed. (Author)

PB-206 907
TRW Systems Group, Redondo Beach, Calif.
APPLICABILITY OF ORGANIC SOLIDS TO THE DEVELOPMENT OF NEW TECHNIQUES FOR REMOVING OXIDES OF SULFUR FROM FLUE GASES.
Final rept. 24 Jun 68-15 Apr 70,
R. A. Meyers, M. Gardner, A. Grunt, J. S. Land, and J. L. Lewis. 15 Apr 70, 198p TRW-10669-6012-RO-00-F APTD-0719
Contract PH-22-68-46
See also Report on Phase 2, PB-187 645.

Descriptors: (*Air pollution, Sulfur dioxide), (*Waste papers, *Adsorbents), (*Sulfur dioxide, *Adsorbents), (*Cellulose, Adsorbents), Newsprint, Regeneration (Engineering), Electric power plants, Shredding, Cost estimates, Mathematical models.
Identifiers: *Air pollution control.

The report shows that, among solid sorbents, the most promising class for removal of SO2 from flue gases is cellulose containing materials such as wood, cotton, and newsprint. In particular, it was found that newsprint regenerably sorbs sulfur dioxide from synthetic flue gas streams at operating temperatures. Preliminary engineering designs and estimates of investment and operating costs for control of four sulfur dioxide contamination sources are presented. The process designed for utilizing cellulosics would employ a moving-bed of shredded paper as a sorbent of sulfur dioxide from flue gas streams. The sulfur dioxide is subsequently removed from the paper by thermal desorption for use as a feed stream in sulfuric acid manufacture. (Author)

PB-206 923
TRW Systems Group, McLean, Va. Washington Operations.
AIR POLLUTANT EMISSION FACTORS, SUPPLEMENT.

Aug 70, 60p* 13799.000 APTD-0922
Contract CPA-22-69-119

Descriptors: (*Air pollution, *Industrial wastes), (*Coal preparation, Air pollution), (*Munitions industry, Air pollution), (*Iron and steel industry, Air pollutions), (*Fertilizers, Air pollution), (*Chemical industry, Air pollution), Sodium carbonates, Nitrates, Chemical engineering, Sources, Concentration (Composition), Particles, Carbon monoxide, Coal dust.

Emission factors are presented for five industrial processes. They are: coal preparation; explosives manufacturing; ferroalloy production; nitrate fertilizers; and soda ash manufacture. The processes involved and types of pollutants are described. (Author)

PB-206 924
TRW Systems Group, McLean, Va. Washington Operations.
AIR POLLUTANT EMISSION FACTORS.
Apr 70, 332p* 13799.000 APTD-0923
CPA-22-69-119

Descriptors: (*Air pollution, *Industrial wastes), (*Incinerators, Air pollution), (*Combustion products, Air pollution), (*Chemical industry, Air pollution), (*Food industry, Air pollution), (*Metal industry, Air pollution), (*Concrete plants, Air pollution), (*Dry cleaning, Air pollution), Particles, Brick industry, Coal, Refuse disposal, Ammonia, Carbon black, Hydrofluoric acid, Paints, Printing inks, Plastics, Detergents, Synthetic fibers, Smelting, Roasting, Quarrying.
Identifiers: Cement industry.

Atmospheric emission data is compiled for a wide variety of selected processes. One-half of the 40 processes discussed involve an updating or review of existing emission factors. Except for the combustion and incineration fields, very little new emission factor data has been made public since 1967. Frequently, material balance calculations were made. Detailed information is generally appended to each section. Whenever possible, the range or variation in emission factors is reported. All emission factors were ranked according to the available data upon which they were based. The range of values for many emission factors is large. The factors are presented in these major sections: Stationary Fuel Combustion; Refuse Disposal; Chemical Manufacturing Industries; Food and Agricultural Industry; Metallurgical Industries; Mineral Products Industry; and Organic Solvents. (Author)

PB-206 938
Research Corp. of New England, Hartford, Conn.
A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELERS RESEARCH CENTER),
Norman E. Bowne, and G. D. Robinson. Sep 71, 81p* APTD-0930
Contract CPA-70-155
Prepared in cooperation with the Center for the Environment and Man, Inc., Hartford, Conn.

Descriptors: (*Air pollution, *Atmospheric models), Computer programs, Sources, Atmospheric composition, Atmospheric diffusion, Mathematical models, Concentration (Composition), Wind (Meteorology), Connecticut.

An air quality model which assumes a form of solution of the equation for a single source, inserts appropriate empirical parameters, and sums the solutions over all sources is described. Three categories of source are recognized in the model: major, intense, discontinuous, i.e., point and line, sources (examples are the stacks of electrical generating or other major industrial plants and highways, etc.); numerous minor sources which are treated as continuous area sources; and sources beyond the boundary of the model. Special devices, effectively a sub-model, which were needed to deal with the proximity of very large sources, unknown in detail, in the area of New York City are described. (Author)

PB-206 939
Center for the Environment and Man, Inc., Hartford, Conn.
PREDICTION BY NUMERICAL MODELS OF TRANSPORT AND DIFFUSION IN AN URBAN BOUNDARY LAYER. VOLUME I.
Final rept.,
Joseph P. Pandolfo, Marshall A. Atwater, and Gerald E. Anderson. Jul 71, 146p* CEM-4082-FR-Vol-1 APTD-0931

Contract CPA-70-62

Descriptors: (*Air pollution, *Atmospheric models), Mathematical models, Atmospheric motion, Atmospheric diffusion, Mixing, Boundary layers, Wind (Meteorology), Air water interactions, Solar radiation, Temperature gradients, Connecticut, Urban areas, Rural areas, Seasonal variations, Diurnal variations.

A three-dimensional numerical model based on the Eulerian conservation equations for momentum, heat, water vapor, salinity, and air pollutants was used to examine the transport and diffusion processes in the planetary boundary layer. Horizontal diffusion was incorporated through a strongly and implicitly diffusive finite-difference scheme for the horizontal advection terms, viz, upwind differencing. However, terms representing other transport and diffusion processes were explicitly included in the differential equations. It is feasible to simulate the temporal variation of meteorological and pollutant variables, on a three-dimensional array containing several thousand grid points, within practical limits on a computer. Simulated urban-rural low level temperature differences in winter are qualitatively realistic. The simulated daytime vertical profile of pollutants show a well-mixed surface layer with quasi-constant concentrations. The nighttime profiles show definite peaks of concentration near the source height. Three-dimensional fields of meteorological and pollutant variables were simulated using Connecticut source inventory data and typical (hypothetical) winter meteorological conditions. (Author)

PB-206 950
Lockheed-Georgia Co., Marietta.
VELOCITY OF PARTICULATE IN LAMINAR AND TURBULENT GAS FLOW BY HOLOGRAPHIC TECHNIQUES.
Final rept.,
J. B. Allen, D. M. Meadows, R. F. Tanner, and L. M. Boggs. Oct 71, 128p APTD-0918
Contract EPA-EHSD-71-34

Descriptors: (*Holography, *Flow distribution), (*Particles, Turbulent flow), Laminar flow, Velocity measurement, Air flow, Particle size, Sampler, Laboratory equipment, Air pollution, Boilers.

A technique for measuring the velocity and behavior of particulate suspended in potential and turbulent air flows by means of double-pulsed holography is presented. Descriptions of the air duct facility, particulate dispenser, and holographic systems are provided as well as discussions of experimental results and theoretical considerations. Double-pulsed holography was proved to be an excellent technique for measuring the characteristics of suspended particulate of sizes greater than 6 microns. The measurable characteristics include velocity, three-dimensional coordinates of the particle, size and shape. Specific experiments were performed to determine the feasibility of the double-pulsed holographic technique. These experiments included studies of particulate behavior in electrostatic fields, in potential and turbulent flow, and around a sampling probe for various sampling conditions. (Author)

PB-206 951
Geomet, Inc., Rockville, Md.
VALIDATION AND SENSITIVITY ANALYSIS OF THE GAUSSIAN PLUME MULTIPLE-SOURCE URBAN DIFFUSION MODEL.
Final rept.,
Robert C. Koch, and Scott D. Thayer. Nov 71, 351p GEOMET-EF-60 APTD-0935
Contract CPA-70-94

Descriptors: (*Air pollution, *Atmospheric diffusion), (*Plumes, Atmospheric diffusion), Urban areas, Mathematical models, Wind (Meteorology), Emission, Gaussian quadrature, Sulfur dioxide, Computer programs, Concentration (Composition), Predictions, Applications of mathematics.

Identifiers: Gaussian plume model.

The analysis and results are presented of a program of validation and sensitivity analysis of the steady-state Gaussian plume type of urban diffusion model. A definition is developed of the fundamental short-term steady-state model and its various modes of implementation, in terms of emission and environmental input parameters, and of calculational modes. A set of computer programs developed especially for validation and sensitivity study purposes is described. Comparisons were made of short-term and long-term concentration predictions from the model, with comparable measured SO2 concentrations covering three months of two-hour values at ten locations in St. Louis, and one month of one-hour values at eight locations in Chicago. Hourly estimates of meteorological and emission parameters were used.

PB-206 954
Beck (R.W.) and Associates, Denver, Colo.
RESEARCH ON DRY-TYPE COOLING TOWERS FOR THERMAL ELECTRIC GENERATION: PART I.,
John P. Rossie, and Edward A. Cecil. Nov 70, 354p EPA-WQO-1630-EES-11/70, W72-04829
Contract DI-14-12-823
Paper copy available from GPO $2.50 as E P2.10:16130EES11/70.

Descriptors: (*Cooling towers, Thermal power plants), (*Thermal power plants, *Water pollution), Cost analysis, Heat exchangers, Waste water, Industrial waste treatment, Economic analysis.
Identifiers: Water pollution control.

An economic analysis is made for the use of dry cooling towers in thermal power plants in the United States. Twenty-seven sites were examined providing in each case capital and operating cost for natural and mechanical draft systems both for fossil and nuclear plants. System optimization was based on capital cost, auxiliary power cost, cost due to loss of capacity, and fuel cost. Comparison was made with wet cooling tower systems. With all factors considered, dry towers would be economically competitive with wet cooling tower systems.

PB-206 963
Kellogg (M. W.) Co., Piscataway, N.J. Research and Engineering Development.
AVAILABILITY OF LIMESTONES AND DOLOMITES. TASK I.
Final rept.,
J. J. O'Donnell, and A. G. Sliger. 1 Feb 72, 267p*
RED-72-1265 APTD-0932
Contract CPA-70-68

Descriptors: (*Limestone, *Geological surveys), (*Dolomite (Rock), Geological surveys), (*Electric power plants, Limestone), Economic analysis, Demand (Economics), Air pollution, Sulfur dioxide, Adsorbents, Carbonate rocks, Marble, Natural resources, United States, Quarrying, Transportation, Cost estimates.
Identifiers: Air pollution control.

The objective was to determine the availability and costs of limestone and similar materials throughout the contiguous United States, thus providing a basis for determining the feasibility and economics of limestone-based SO2 removal processes for any particular power plant site. Materials covered include limestone, dolomite, chalk, marble, marl, and shell. Information is presented on location of deposits, production rates, F.O.B. quarry costs, transportation methods and costs, expected cost increases, uses, chemical composition, and physical properties. Much of the data is reported nationally, regionally, and on a state-wide basis. The regions were chosen to coincide with those defined by the National Coal Association. The major deposits of carbonate rocks occur in the eastern half of the United States, where the vast majority of fossil fuel-fired power plants are located. Limestone is the only type of carbonate rock which is produced in large enough quantities to merit consideration for widespread application. (Author)

PB-206 964
National Air Pollution Control Administration, Durham, N.C. Air Quality and Emission Data Program.
SPRINGFIELD, OHIO. AIR POLLUTANT EMISSION INVENTORY.
David V. Mason. Aug 69, 8p APTD-0840

Descriptors: (*Air pollution, *Ohio), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Springfield (Ohio), Clark County (Ohio).

An emission inventory of the Springfield, Ohio SMSA is presented. The Springfield SMSA is made up of only one county, Clark County, which borders the Dayton SMSA. Clark County's 1967 population was 137,700. The results of the inventory are presented on a grid reference system and in tables. For each of the pollutants (sulfur oxides, particles, carbon monoxide, hydrocarbons, and nitrogen oxides), a summary of the 1967 emissions is tabulated for each of these source categories: transportation (road vehicle, evaporation); combustion of fuels in stationary sources (industry, steam-electric, residential, commercial); refuse disposal (incineration, open burning); and industrial process. (Author)

PB-207 065-D
Environmental Protection Agency, Dallas, Tex. Air and Water Programs Div.
CONSTRUCTION OF WASTE FACILITIES, RED OAK, TEXAS. WPC-TEX-533.
Draft environmental impact statement.

25 Feb 72, 61p Impact Statement-7103 ELR-1993

Descriptors: (*Environmental surveys, *Water treatment), (*Texas, Environmental surveys), Waste treatment, Water pollution, Activated sludge process, Water quality, Noise (Sound), Insects, Chlorine.
Identifiers: *Environmental impact statements, *Wastewater treatment facilities, *Red Oak (Texas).

The City of Red Oak, Ellis County, Texas has applied for federal funds to aid in constructing a complete wastewater treatment system. The adverse environmental impact effects which cannot be avoided are odor and noise production, insect propagation, organic sediments, effect of chlorine on the stream. (Author)

PB-207 103
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
MIXING HEIGHTS, WIND SPEEDS, AND POTENTIAL FOR URBAN AIR POLLUTION THROUGHOUT THE CONTIGUOUS UNITED STATES,
George C. Holzworth. Jan 72, 126p AP-101
Paper copy available from GPO $1.25 as EP4.9:101.

Descriptors: (*Air pollution, *Atmospheric motion), (*Urban areas, Atmospheric motion), Forecasting, Temperature inversions, Wind (Meteorology), Climatology, Seasonal variations, Mixing, Graphs (Charts), Wind velocity, Dispersing.
Identifiers: *Air pollution forecasts, *Air pollution episodes.

There is interest in pertinent climatological information and an overall appraisal thereof in terms of quantitative pollution potential. As used here, the

potential for urban air pollution refers to certain meteorological factors that generally are important in the transport and diffusion of pollutants emitted by myriad but non-trivial sources in urban complexes. The mixing-layer height and the average wind speed within the mixing layer were calculated twice for each day of a 5-year record of upper air observations at 62 National Weather Service stations in the contiguous United States. These calculations illustrate the typical large diurnal variation in atmospheric dispersion. Twenty charts present seasonal and annual, and morning and afternoon mean mixing heights and wind speeds. A model of some general dispersion features over urban areas is described in which the normalized pollutant concentration averaged over a city is a function of mixing height, wind speed, and city size (distance the wind travels across the city). Isopleths of the total number of episode-days for episodes lasting at least 2 days and at least 5 days with various limiting mixing-height and wind-speed values are presented in 20 charts. (Author)

PB-207 107
Scott Research Labs., Inc., Plumsteadville, Pa.
A STUDY OF AIRCRAFT POWERPLANT EMISSIONS.
Final rept.,
Anthony F. Souza. 3 Jan 71, 266p APTD-0916
Contract EPA-68-04-0037

Descriptors: (*Air pollution, Exhaust gases), (*Aircraft engines, *Exhaust gases), Piston engines, Gas turbine engines, Spark ignition engines, Gas analysis, Concentration (Composition), Test engines, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Aldehydes.

Emissions from forty-two light aircraft piston engines and twenty-six military gas turbine engines have been measured and documented. Piston engine aircraft were leased from local general aviation suppliers and the engine exhaust emissions tested using a ten mode test cycle during a ground run-up. In addition crankcase ventilation emissions were measured on six engines and mass emission rates were calculated. Exhaust component concentrations and fuel consumption rates were measured at specified engine operating conditions. The exhaust analyzer readings were converted to pollutant concentrations and mass emission rates. The data were analyzed to determine engine-to-engine variations for each model engine, the effect of hot versus cold start, and the role of engine operating parameters. (Author)

PB-207 108
Hittman Associates, Inc., Columbia, Md.
COST NOMOGRAPHS OF SELECTED SULFUR DIOXIDE ABATEMENT METHODS.
Jan 72, 148p* HIT-508 APTD-0919
Contract EHSD-71-43

Descriptors: (*Air pollution control equipment, Cost comparison), (*Air pollution, Sulfur dioxide), (*Electric power plants, Air pollution control equipment), (*Sulfur dioxide, Air pollution control equipment), Cost estimetes, Nomographs, Coal, Fuel oil, Desulfurization, Transportation, Adsorption, Injection, Limestone, Magnesium oxides, Vanadium oxides, Vanadium oxides, Capital costs, Operating costs.
Identifiers: *Air pollution control, Molten carbonate process, TYCO process, Magnesium oxide scrubbing, Limestone injection, Cat-Ox process, Waste gas recovery.

The results are presented of a study which was undertaken to provide a basis for assessing the costs and effectiveness of alternative sulfur dioxide control systems for emissions of fossil fuel combustion from power generating facilities. The study attempts to provide a set of nomographs which would allow rapid and accurate assessment of these control alternatives. Sulfur emissions can be controlled by either stack gas control processes, desulfurization of oil or coal, or the burning of naturally-occurring low sulfur fuels. The economic aspects involved are the capital and operating costs of stack gas and desulfurization facilities and the incremental costs of purchasing and shipping low sulfur fuels. The most current technical and economic data were compiled and evaluated for six stack gas processes. The costs per ton of coal or per barrel of oil were determined given a variety of conditions. The cost of transporting bulk reactants or low sulfur fuels can be significant when studying control economics. (Author)

PB-207 109
Institute of Public Administration, Washington, D.C.
POLLUTION ABATEMENT AND UNEMPLOYMENT. A METHODOLOGICAL STUDY,
John Hoicka, Terry Trumbull, and Helen Scott. 31 Jan 72, 154p* APTD-0921
Contract EHS-70-126

Descriptors: (*Industrial plant efficiencies, Pollution), (*Pollution, *Economic conditions), (*Unemployment, Pollution), (*Air pollution, Economic conditions), (*Water pollution, Economic conditions), Economic analysis, Industrial plants, Financing, Abatement, Government policies, Prices, Iron and steel industry, Foundries, Cost estimates.
Identifiers: Cement industry, Copper industry, Air pollution control, Water pollution control.

A report is presented of a study which develops a methodology to estimate the magnitude of unemployment that may be expected as a result of plant closures caused by pollution abatement requirements. This study is directed at the very small minority of plants that might reduce or cease operations and thereby lay off their employees. The report specifies the types of financial assistance required to avoid closure, and describes the kinds of plants affected and programs which might be instituted, should the need arise. The study also provided insights into the appropriate types of Federal Government response, should the magnitude of unemployment warrant action. (Author)

PB-207 110
Walden Research Corp., Cambridge, Mass.
SYSTEMATIC STUDY OF AIR POLLUTION FROM INTERMEDIATE-SIZE FOSSIL-FUEL COMBUSTION EQUIPMENT.
Final rept.,
John R. Ehrenfeld, Ralph H. Bernstein, Katherine Carr, Josette C. Goldish, and Ronald G. Orner. Jul 71, 340p* APTD-0924
Contract CPA-22-69-85

Descriptors: (*Air pollution, Combustion products), (*Electric power plants, Air pollution), (*Air pollution control equipment, *Furnaces), Boilers, Sulfur dioxide, Nitrogen oxides, Particles, Forecasting, Inventories, Cost estimates, Economic analysis, Fuel oil, Coal, Natural gas, Fly ash.
Identifiers: *Air pollution control.

The electric power industry is one of the major stationary-source contributors to air pollution. A basis is provided for assessing the relative significance of this class of sources and for establishing a research and development plan to develop control means. The pollutant sources are identified according to equipment type and size, regional distribution, fuel, user, age and other factors of significance to air pollution emissions. Estimates of installed capacity were made for the base year - 1967, with projections for 1975, 1980, 1985, 1990. Only intermediate-size conventional boilers were included. Boilers were broken down according to type and size. Annual emissions of SO2, NO (x) and particulates were computed by applying a series of operating factors (boiler efficiency, load factor, etc.) to the capacity inventory using a computer program (STRAT). The identification and the analysis of the cost-effectiveness of possible control approaches was also made. The major strategies examined included: fuel switching; flue gas treatment; and combution modification. Process designs and costs data were developed. The STRAT program was used to assess the relative cost and effect on pollutant reduction of a variety of different strategies. (Author)

PB-207 111
Voorhees (Alan M.) and Associates, Inc., McLean, Va.
AIR QUALITY CONSIDERATIONS IN TRANSPORTATION AND URBAN PLANNING. A FIVE-YEAR PROGRAM GUIDE.

Dec 71, 199p* APTD-0933
Contract CPA-70-100
Prepared in cooperation with Ryckman, Edgerley, Tomlinson and Associates, St. Louis, Mo.

Descriptors: (*Air pollution, *Urban planning), (*Transportation, Air pollution), Urban areas, Land development, Land use, Demography, Mass transportation, Exhaust gases, Highway transportation, Air transportation, Atmospheric motion, Urban transportation, Land use zoning, Law (Jurisprudence).

The scope of the research described was to determine and demonstrate the air pollution aspects of urban and transportation planning and to encourage the inclusion of air quality control considerations in the planning process. The need for the study is based on the fact that urban planning decisions, which have profound effects on ambient air quality, are often made without proper consideration of their air pollution consequences. The recommendations include a summary of the basic work items for the five-year program of research and support activities. The contribution that urban and transportation planning can make to the improvement of air quality was developed. The inter-relationships between air pollution, land use, and transportation systems are described, based on an intensive state-of-the-art review. The role of urban and transportation planning in air quality control is discussed in the following contexts: land development and density patterns; spatial arrangement of buildings and site activities; planning of transportation systems; design and construction practices; and operation of buildings and transportation facilities. (Author)

PB-207 124
Environmental Protection Agency, Washington, D.C. Office of Noise Abatement and Control.
COMMUNITY NOISE.
31 Dec 71, 212p* EPA-NTID300.3
Prepared in cooperation with Wyle Labs., Rockville, Md.

Descriptors: (*Noise (Sound), *Communities), (*Acoustic measurement, Environmental surveys), Loudness, Urban areas, Rural areas.
Identifiers: *Noise pollution.

The report addresses the part of the overall noise pollution problem which is associated with outdoor noise in the community. It attempts to provide a quantitative framework for understanding the nature of the outdoor noise environment and the reaction of people and community to its various aspects. The detailed information provides material relevant to meaningful measures of the noise environment for both future community noise monitoring and research purposes. (Author)

PB-207 125
Environmental Protection Agency, Washington, D.C. Office of Noise Abatement and Control.
NOISE PROGRAMS OF PROFESSIONAL/INDUSTRIAL ORGANIZATIONS, UNIVERSITIES AND COLLEGES.

31 Dec 71, 86p* EPA-NTID300.9

Descriptors: (*Noise, *Research projects), Research management, Universities, Organizations, Industrial management, Noise reduction, Financing, Education.
Identifiers: Noise pollution.

The report provides information pertaining to noise programs being sponsored or carried out, either directly or indirectly, by professional, industrial, and voluntary associations (societies) and provides information on private industry research and educational and research programs. Also provided is a bibliography of pertinent publications relating to noise. The information contained in the report is based upon that requested and received from the Scientific Information Exchange of the Smithsonian Institute and the Acoustical Society of America and that obtained by the Office of Noise Abatement and Control from professional organizations. (Author)

PB-207 126
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
HELENA VALLEY, MONTANA, AREA ENVIRONMENTAL POLLUTION STUDY.

Jan 72, 194p AP-91

Descriptors: (*Air pollution, *Montana), Sources, Smelting, Environmental surveys, Sulfur dioxide, Arsenic, Cadmium, Lead, Zinc, Particulates, Nitrogen oxides, Trace elements, Plants (Botany), Soil chemistry, Toxicology, Metabolism.
Identifiers: *Helena (Montana), Helena Valley, *Air pollution effects (Plants), *Air pollution effects (Animals).

Because it had been alleged that pollutants are contributing to the endangerment of health and welfare in the Helena Valley, Montana, the study was undertaken to provide factual information bearing on the allegations and to aid in delineating the solution of any observed problem. The investigation concerned contamination of the environment by arsenic, cadmium, lead, zinc, and sulfur dioxide from the industrial smelting complex in the city of East Helena. The study included the investigation of in-plant air quality and lead accumulation in smelter workers. (Author)

PB-207 189
Robert A. Taft Water Research Center, Cincinnati, Ohio.
COST OF RECLAMATION AND MINE DRAINAGE ABATEMENT - ELKINS DEMONSTRATION PROJECT,
Robert B. Scott, Ronald D. Hill, and Roger C. Wilmoth. 1970, 29p EPA-14010-10/70, W72-04587
Revision of paper presented at the Society of Mining Engineers meeting, St. Louis, Missouri, 21-23 Oct 70 (Paper 70-AG-349).

Descriptors: (*Water pollution, *Mine waters), (*Coal mines, Sealing), Surface mining, Cost estimates, Land reclamation, Vegetation, pH, Masonry, Clays, Clearing, West Virginia.
Identifiers: *Water pollution control, *Mine acid drainage, Water pollution economics.

Acid mine drainage, discharging from coal beds, pollutes streams and rivers. An acid mine drainage reclamation project was established in the Roaring Creek-Grassy Run watershed near Elkins, West Virginia. The control costs established from the project are presented. The costs include those for clearing, grubbing, reclamation, and revegitation. (Author)

PB-207 190
Singmaster and Breyer, New York.
AN EVALUATION OF THE ATOMICS INTERNATIONAL MOLTEN CARBONATE PROCESS.

30 Nov 70, 255p APTD-0927
Contract CPA-70-76

Descriptors: (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, *Adsorption), (*Adsorbents, *Carbonates), (*Air pollution control equipment, Sulfur dioxide), Fused salts, Chemical engineering, Cost estimates, Electric power plants, Performance evaluation, Scrubbers, Capital costs, Lithium carbonates, Operating costs, Smelting, Electrostatic precipitators, Cost effectiveness, Engineering drawings, Coal, Design criteria, Gas filters.
Identifiers: *Molten carbonate process, *Air pollution control, Air pollution economics, *Waste gas recovery, Claus process, Copper industry.

The Molten Carbonate Process for the removal of sulfur oxides from power plant stack gases has been evaluated. The purpose of the evaluation was to advise on the continued course of action regarding this process. The removal of sulfur oxides from an 800 MW power plant operated with coal containing 3% sulfur was selected as a base case. Alternate cases involving coal-burning power plants were included. Various copper smelter situations were also reviewed. Process and engineering problem areas were identified and potential solutions were examined. Cost estimates are given detail. The process converts recovered sulfur oxides successively to sulfides and H2S. (Author)

PB-207 309
PEDCo-Environmental Specialists, Inc. Cincinnati, Ohio.
DEVELOPMENT OF EMERGENCY PROCEDURES FOR THE PREVENTION OF AIR POLLUTION EPISODES. STATE OF WISCONSIN.
Final rept.,
George A. Jutze, and Martin F. Massoglia. Dec 71, 215p APTD-0892
Contract EPA-68-02-0044

Descriptors: (*Air pollution, *Wisconsin), Government policies, Regulations, Public health, State government, Warning systems, Planning, Sources, Handbooks, Abatement, Industrial wastes, Particles, Sulfur dioxide, Carbon monoxide, Nitrogen oxides, Hydrocarbons.
Identifiers: *Air pollution episodes, *Implementation Air Pollution Planning Program, Emergency planning, Air pollution public emergency limits.

The report presents a compendium of the documents developed for the State of Wisconsin for its Emergency Episode Program. These documents are as follows: Prevention of air pollution emergency episodes; Summary tables for episode strategies; Point source emission reduction procedures - emergency episode plan; Regulations for prevention of air pollution emergency episodes. (Author)

PB-207 310
National Park Service, Washington, D.C. Div. of History.
THE FERRYBOAT, ELLIS ISLAND, TRANSPORT TO HOPE. STATUE OF LIBERTY NATIONAL MONUMENT.
Basic data study.
Edwin C. Bearss. 30 Apr 69, 235p FNP-HH-72-102

Descriptors: (*National parks, *History), Sites, Public land, Construction, Reviews, Monuments, New York.
Identifiers: *New York City National Park Service Group, *Statue of Liberty National Monument, *Ellis Island ferryboat.

The report was prepared to satisfy the research needs set forth in Historical Resource Study Proposal SL (Ellis Island)-H-2. It is a structural study and evaluation of the U.S. Ferryboat-'Ellis Island.' This study is designed to provide information regarding the construction and history of the 'Ellis Island.' For 50 years the 'Ellis Island' was intimately associated with the Ellis Island story. She transported immigrants from Ellis Island to the United States and put them 'ashore on our land--their future home and country.' The 'Ellis Island' is important in interpreting the story of Ellis Island and immigration. (Author)

PB-207 312
Dow Chemical Co., Midland, Mich. Organic Chemicals Dept.
DEVELOPMENT OF PARTICULATE EMISSION CONTROL TECHNIQUES FOR SPARK-IGNITION ENGINES.
Final technical rept. May 70-Jul 71,
John B. Moran, Otto J. Manary, Russell H. Fay, and Michael J. Baldwin. Jul 71, 182p* APTD-0949
Contract EPA-EHSH-70-101
See also PB-198 033.

Descriptors: (*Particles, *Exhaust gases), (*Air pollution, Exhaust gases), (*Air pollution control equipment, *Automobile engines), Spark ignition engines, Gasoline, Lead, Gas filters, Fused salts, Particle size, Dynamometers, Lead inorganic compounds, Surface properties, Exhaust systems, Gas sampling, Electron microscopy, Gas analysis, Catalysts.
Identifiers: *Automobile exhaust, Catalytic reactors (Exhaust systems), *Air pollution control, Molten salt scrubbers.

The report describes work carried out on a research program to characterize and trap particulate emissions from automotive power plants. The report describes the characterization of particulate matter emitted from automotive power plants operating on leaded gasoline. Particle characterization was carried out with a dynamometer controlled engine operating at the equivalent of 60 mph cruise, 30 mph cruise, and under mild cycling conditions. The development of an exhaust particle-trap device is also described. Also described is the characterization of particulate emissions from automotive power plants operating on nonleaded fuels. Changes in the particulate emissions were determined at a rich and lean air/fuel ratio and in the presence of two catalytic converters. Particle mass emission rates, particle mass-size distributions, and total aldehyde emissions were measured. (Author)

PB-207 319
CONSAD Research Corp., Pittsburgh, Pa.
THE OAP REGIONAL ECONOMIC MODEL UTILIZATION. PHASE I. VOLUME I. SIMULATION AND ANALYSIS.
Final rept.,
T. R. Lakshmanan, F. Lo, and R. Byrne. 7 Jan 72, 247p* APTD-0946
Contract DI-68-04-0039
See also Volume 2, PB-207 320.

Descriptors: (*Air pollution, *Economic models), (*Regional planning, Air pollution), (*Water pollution, Economic models), Abatement, Strategy, Government policies, Cost estimates, Economic forecasting, Economic analysis, Waste disposal, Financing, Sources, Industrial wastes, Industrial waste treatment, Computerized simulation.
Identifiers: *Air pollution economics, Implementation air pollution planning program, Air pollution abatement, Economic impact, *Solid waste disposal, Air Quality Control Regions.

A regional economic model for the assessment of the effects of air pollution abatement has been developed and demonstrated. This model is operational and policy oriented and attempts to describe the economic system-wide effects specific air pollution strategies in 91 major metropolitan areas in the United States. This phase of the model utilization effort has been structured into a set of four tasks which encompassed the following areas: Implementation strategies: approach and specification; Control costs and economic projections; Economic effects of selected strategies; Application to water pollution and solid waste disposal; and Remarks and recommendations. The application of the model to water pollution and solid waste

disposal is discussed and a bibliography presented. (Author)

PB-207 320
CONSAD Research Corp., Pittsburgh, Pa.
THE OAP REGIONAL ECONOMIC MODEL UTILIZATION. PHASE I. VOLUME II. REVISED USER'S GUIDE.
Final rept.

7 Jan 72, 146p* APTD-0947
Contract DI-68-04-0039
See also Volume 1, PB-207 319.

Descriptors: (*Air pollution, *Computerized simulation), (*Regional planning, Air pollution), Programming manuals, Economic models, Computer systems programs, Abatement, Data processing, Input output routines, Cost estimates.
Identifiers: *Air pollution economics, Air Quality Control Regions, Air pollution abatement.

A revised user's guide of the Office of Air Programs (OAP) Economic Model System is presented to facilitate an efficient assessment of control strategies. Air pollution control strategies are first transformed into a set of appropriate model inputs. The computer program accepts these inputs as 'exogenous shocks' to the model system and generates as output, from the model system, measurements of the changes in the key economic variables in the air quality control regions under study. The computer simulation of the Economic Model System includes three programs: Program RMS (Regional Model Simulation), Program 10A (Input-Output Analysis), and Program FBE (Feedback Effects). The report also presents control cost estimates. (Author)

PB-207 321
Pratt and Whitney Aircraft, East Hartford, Conn.
COLLECTION AND ASSESSMENT OF AIRCRAFT EMISSIONS BASELINE DATA - TURBINE ENGINES.
Final rept.,
A. W. Nelson. Feb 72, 176p PWA-4339
APTD-0948
Contract EPA-68-04-0027

Descriptors: (*Air pollution, Exhaust gases), (*Gas turbine engines, *Exhaust gases), (*Aircraft engines, Exhaust gases), Turbofan engines, Gas sampling, Samplers, Design, Gas analysis, Smoke, Particles, Alkene hydrocarbons, Aldehydes, Hydrocarbons, Nitrogen oxides, Static tests.
Identifiers: *Aircraft exhaust.

A report is presented of a study in which the design and fabrication of a multipoint sampling rake was completed. A check-out test of the rake using a JT9D experimental engine indicated that the exhaust emission sample obtained from the rake was very close to the average of the samples obtained from the individual probes located adjacent to the 12 rake sampling points. This probe was then used to sample the exhaust emission from an experimental engine of each of the JT3D, JT8D, and JT9D engine models, plus production engines. All of the mass emission results obtained during the program were subjected to a statistical analysis. The results of this analysis were then used in a hypothetical aircraft operational cycle. Measurements of smoke, dry particulates, total particulates, aldehydes, and olefins were also recorded. (Author)

PB-207 348
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
STROAGE AND RETRIEVAL OF AEROMETRIC DATA PARAMETER CODING MANUAL,
Donald H. Fair, John B. Clements, and George B. Morgan. Jul 71, 173p APTD-0633

Descriptors: (*Air pollution, *Coding), (*Data retrieval, Air pollution), Manuals, Particles, Oxidizers, Aliphatic compounds, Aromatic compounds, Heterocyclic compounds, Pesticides, Pollen, Atmospheric motion, Meteorological data.
Identifiers: *SAROAD (Storage and retrieval of air quality data), Air quality data.

For orderly storage and retrieval of aerometric data in computer data banks, all pollutants and parameters must be classified according to some logical system of coding structure. The manual describes the coding system used by the Environmental Protection Agency in maintaining the National Aerometric Data Bank. It lists the codes now assigned to certain pollutants and parameters. Although the coding system is not yet complete, the information now available and given in this manual will be useful to users of the SAROAD system. (Author)

PB-207 350
Abt Associates, Inc., Cambridge, Mass.
FACTORS AFFECTING POLLUTION REFERENDA.

Jun 71, 317p EPA-WQO-16110-EXW-06/71, W72-05669
Contract EPA-WQO-14-12-902
Paper copy available from GPO $2.50 as SN-5501-0110.

Descriptors: (*Sewage treatment, Financing), (*Sanitary engineering, *Financing), (*Local government, Financing), Regression analysis, Elections, Planning, Government policies, Water pollution, Abatement, Data processing, Attitude surveys.
Identifiers: Water pollution economics, Referendums, *Bond issues.

Defeat of a pollution control bond in a local community can result in a significant delay in the implementation of the Federal Water Pollution Control Act. Hence, it is important that the Environmental Protection Agency understand what factors affect the outcome of municipal bond elections so that it can offer assistance wherever possible. Initial statistical investigation identified 34 independent variables associated with the outcome of bond elections in a non-random pattern. Regression analysis then identified eleven variables which together explain 62% of the variance in the outcome of bond elections for water pollution control. These eleven variables can be grouped into four categories: population characteristics, community characteristics, characteristics of the bond issue, and campaign characteristics. (Author)

PB-207 358
Syracuse Univ., N.Y. Dept. of Civil Engineering.
BENEFITS OF WATER QUALITY ENHANCEMENT.

Dec 70, 194p EPA-WQO-16110-DAJ-12/70, W72-05666
Paper copy available from GPO $1.75 as EP2.10:161/0DAJ.

Descriptors: (*Water pollution, *Benefit cost analysis), (*Government policies, Water pollution), (*Regional planning, *Water quality), Local government, Cost indexes, Recreation, Land use, Sewage treatment, Water resources, New York, Cost estimates, Water supply, Agriculture, Industrial water, Abatement.
Identifiers: *Water pollution control, Oneida Lake, *Onondaga County (New York).

The report is concerned with the implementation of pollution abatement at a local level of government. The report is in three parts. The first contains a discussion of the past practices and recent trends in water pollution control as it relates to water quality. Next the dollar benefit of a lake or stream at a given water quality is determined by listing all uses which both affect and are affected by water quality, by valuing each use individually, and by summing the resultant values. Finally a study was undertaken of a methodology for water pollution abatement administration at the local or regional level, using Onondaga Lake, N. Y. as an example. (Author)

PB-207 480
Envirogenics Co., El Monte, Calif.
BIOLOGICAL METHODS OF SLUDGE DEWATERING.
Final rept.

Aug 71, 147p* W72-05838, EPA-17070-EVY-08/71
Contract FWQA-14-12-427

Descriptors: (*Sludge disposal, *Dewatering), (*Muramidase, Sludge disposal), (*Filtration, *Sludge), Filter aids, Sewage treatment, pH control, Biodeterioration, Deflocculating.
Identifiers: Depolymerases.

Improved dewatering of sewage sludge has been accomplished for the first time by biological means; namely, through the agency of the enzyme lysozyme acting under controlled conditions. Improved dewatering was measured by a 4 to 8-fold increase in filtration rate, which, if extrapolated to plant scale operations, should result, in a given time period, in a 2 to 3-fold increase in solids yield, thus achieving a significant cost saving. A number of other exo- and endo-enzymes were also tested for their effects on dewatering, with uncertain results. Several microorganisms were isolated that showed lysis around their colonies when they were grown on agar plates containing sludge. Of major significance is the demonstration that the relative mild conditions of a biological process permit attacking the sludge dewatering process at its source - the matrix material. (Author)

PB-207 506
TRW Systems Group, McLean, Va. Washington Operations.
ENGINEERING AND COST EFFECTIVENESS STUDY OF FLUORIDE EMISSIONS CONTROL. VOLUME I.
Final rept.,
J. M. Robinson, G. I. Gruber, W. D. Lusk, and M. J. Santy. Jan 72, 410p* SN-16893-000 APTD-0945
Contract EPA-EHSD-71-14
Prepared in cooperation with Resources Research, Inc., McLean, Va.

Descriptors: (*Air pollution, *Fluorides), (*Air pollution control equipment, Fluorides), Economic analysis, Cost effectiveness, Industrial wastes, Aluminum industry, Iron and steel industry, Electric power generation, Coal, Combustion products, Phosphate deposites, Benefication, Glass industry, Smelting, Alkylation, Hydrogen fluoride, Chemical industry, Metal industry, Trends, Clays, Cost estimates, Gas sampling, Public health.
Identifiers: *Air pollution economics, *Air pollution control, Cement industry, Air pollution detection, Air pollution effects (Plants), Air pollution effects (Animals), Air pollution effects (Materials).

The results of a study are presented in which primary emphasis has been placed upon the determination of the engineering and cost effectiveness of control of soluble fluoride emissions from the major industrial sources. The report presents the following information: Industry by industry descriptions of each production and control process of significance from a fluoride emission control standpoint; Discussions of production trends extrapolated to the year 2000; process flow diagrams and mass balances for typical current plants; estimates of current and projected fluoride emissions; Analysis of production and control process economics; Descriptions, cost estimates, priority assignments and schedules for the additional research and development programs recommended as the result of this study; Environmental and ecological effects of the emitted fluorides; and Techniques for sampling, and measurement of

fluoride pollutants in the various effluent streams. (Author)

PB-207 535
National Academy of Sciences-National Research Council, Washington, D.C. Div. of Medical Sciences.
BIOLOGIC EFFECTS OF ATMOSPHERIC POLLUTANTS. FLUORIDES.

1971, 306p APTD-0683
Contract CPA-70-42
Library of Congress Catalog Card No. 70-169178.
International Standard Book No. 0-309-01922-2.
Paper copy available from Printing and Publishing Office National Academy of Sciences 2101 Constitution Ave., N.W. Washington, D.C. 20418 PC$6.50.

Descriptors: (*Air pollution, *Fluorides), (*Public health, Fluorides), (*Toxicology, Fluorides), Trace elements, Mineral metabolism, Humans, Animals, Plants (Botany), Excretion, Exposure, Bones, Teeth, Chemical analysis, Soil chemistry, Cattle, Industrial wastes, Sources, Occupational diseases.
Identifiers: *Air pollution effects (Animals), *Air pollution effects (Plants).

An evaluation and distillation of the world's literature on the biologic effects of airborne fluoride resulted in the following presentation of information: An environmental appraisal of man-made and natural sources; A discussion of the transfer of fluoride in the environment, its physical and chemical changes, its regional and local variations, and its biologic transformations; Environmental sampling and analysis of fluoride; The effects of fluorides on enzymes, cells, and isolated organ and tissue systems and its metabolic effect on intact plants, animals and humans; A discussion of some population studies, consideration of population groups that may have some social susceptibility, and guidelines for occupational and environmental exposure. (Author)

PB-207 640
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
INTERIM REPORT, UPPER KLAMATH LAKE STUDIES, OREGON.
Water pollution control research series,
William E. Miller, and Jerry C. Tash. Sep 67, 45p WP-20-8 W72-06052, FWPCA-16010-09/67

Descriptors: (*Limnology, *Nutrients), (*Lakes, Limnology), (*Algae, Limnology), Water analysis, Sediments, Fresh water biology, Tracer studies, Carbon 14, Radioactive isotopes, Water pollution, Benthos, Surface water runoff, Oregon, Primary biological productivity.
Identifiers: *Eutrophication, Klamath Lake, Aphanisomenon.

The water quality in Upper Klamath Lake watershed, Oregon, is defined. The sources of algal nutrients and other constituents in water flowing into and out of Upper Klamath Lake are identified and the quantity of these constituents is compared in pristine streams, canals, rivers, agricultural drainage, and springs. Chemical analyses were made of algae, lake sediment and bottom fauna samples. Algal species were identified and measured. Aphanizomenon flos-aquae represented about 90-99 percent of the total algal crop during the summer. Limiting nutrient studies using the isotope Carbon-14 to measure variations in primary productivity were conducted in situ and in the laboratory. (Author)

PB-207 643
Pacific Northwest Water Lab., Corvallis, Oreg.
FIELD STUDIES ON SEDIMENT-WATER ALGAL NUTRIENT INTERCHANGE PROCESSES AND WATER QUALITY OF UPPER KLAMATH AND AGENCY LAKES, JULY 1967-MARCH 1969,
A. R. Gahler. Oct 69, 61p Working Paper-66 W72-06051, FWPCA-16010-10/69

Descriptors: (*Limnology, *Sediment transport), (*Nutrients, Sediment transport), Lakes, Algae, Wind (Meteorology), Mixing, Benthos, Diffusion, Water analysis, Dissolved gases, Oregon, Phytoplankton.
Identifiers. *Eutrophication, Klamath Lake.

Studies of algal nutrient interchange between sediment and water under environmental conditions were carried out in Upper Klamath Lake, Oregon. Experimental 'pools' of lake water in contact with the sediment and experimental pools of water not exposed to the sediment were compared with the open lake. Water quality measurements were made to determine whether interchange processes could be observed directly in the water, to establish conditions for laboratory interchange tests, and to compare lake conditions with the experimental pools. Interchange definitely occurred when Oscillatora floated to the lake surface with attached sediment which contained soluble nitrogen and phosphorus compounds. The effects of gas evolution, wind, currents, fish, boating, benthos, diffusion, etc., on the shallow lakes was not quantitatively determined, but it seems quite probable that anything that stirs the sediment causes interchange of nutrients. (Author)

PB-207 644
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
INDUSTRIAL WASTE GUIDE ON LOGGING PRACTICES.

Feb 70, 82p* W72-06053, FWPCA-13010-02/70
See also Rept. no. PB-197 262.

Descriptors: (*Water pollution, *Industrial wastes), (*Lumbering, Water pollution), (*Surface water runoff, Water pollution), Water quality, Suspended sediments, Forest land, Heat, Erosion control, Roads, Vegetation, Clearing.
Identifiers: *Water pollution control, Thermal pollution.

Logging is an industrial activity which takes place in the commercial forest lands covering 40 percent of the land area of the Pacific Northwest. Logging can--and at many locations does--degrade the quality of water in the streams draining the forest lands. The report is dedicated to the logging practices which must be adopted by the logging industry if water quality is to be protected in the streams of the Pacific Northwest. An adequate tree harvesting plan includes maps, sketches, or pictures of the area to be harvested. Specifications are given for the building, use, and maintenance of a well-designed transportation system. Sections deal with logging roads, tree cutting, log yarding, buffer strips, watershed restoration, and municipal water supply watersheds. (Author)

PB-207 645
Envirogenics Co., El Monte, Calif.
REVERSE OSMOSIS RENOVATION OF PRIMARY SEWAGE.

Feb 71, 62p W72-06054, EPA-EQO-17040-EFQ-02/71
Contract EPA-WQO-14-12-885
Paper copy available from GPO $0.65 as EP2.10:17040EFQ02/71.

Descriptors: (*Sewage treatment, *Osmosis), Fouling, Flux (Rate), Flocculating, pH control, Suspended sediments, Membranes, Precipitation (Chemistry), Calcium sulfates, Enzymes, Detergents.
Identifiers: *Reverse osmosis.

A reverse osmosis pilot plant was operated on both primary and secondary effluent and the results compared. Data indicated that high axial feedwater velocities were necessary to prevent membrane fouling. The main substances causing fouling were suspended particulates, inorganic salt precipitates, and dissolved organic matter, as well as some other substances which are unknown at this time. Suspended particulates were flocculated, settled, and filtered out of the wastes, inorganic salt precipitation was controlled by pH adjustment, except in the presence of calcium sulfate, and dissolved organic matter can be removed by biological treatment. Cleansing the membrane with an enzyme-active laundry presoak formulation proved beneficial for both wastes. (Author)

PB-207 646
Beet Sugar Development Foundation, Fort Collins, Colo.
STATE-OF-ART, SUGARBEET PROCESSING WASTE TREATMENT.
Water pollution control research series.

Jul 71, 150p W72-06055, EPA-WQO-12060-DSI-07/71
Paper copy available from GPO $1.25 as EP2.10:12060DSI07/71.

Descriptors: (*Water pollution, *Industrial wastes), (*Food processing, *Industrial waste treatment), (*Sugar beets, Food processing), (*Waste disposal, Food processing), Reviews, Sugar, Biochemical oxygen demand, Industrial water, Precipitation (Chemistry), Cooling water, Calcium carbonates, Molasses, Western Europe, United States.
Identifiers: *Water pollution control, *Solid waste disposal, Steffen waste, *Sugar beet processing.

The United States beed sugar industry produces annually in excess of 3 million tons of sugar from about 25 million tons of beets grown in 19 states. Discharge of wastes has dropped from 30 to 40 lbs BOD/ton of beets sliced to 3.15 lbs BOD/ton of beets sliced, but the total annual discharge is still 79 million pounds of BOD. Fifty-eight beet sugar factories operating in 1968-69 were studied as to waste disposal practices, amounts of water used, and water re-use practices. Main water usages are flume or transport water, process water, lime mud, condenser water, Steffan dilution water, and miscellaneous other uses. Sedimentation ponds and clarifiers are the most widely used solids separation processes, but much of the waste disposal problem is eliminated by recycling, to the extent that several of the plants studied had no effluent BOD discharges. No average waste treatment costs for the industry were presented, since such costs are subject to such a wide plant to plant variation. Needed research is outlined, and a brief description of the entire beet sugar process is presented. Current practices in several Western European countries are also presented. (Author)

PB-207 648
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
PITTSBURGH METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Michael J. McGraw, and Charles S. Holt. Nov 68, 64p APTD-0895

Descriptors: (*Air pollution, *Pennsylvania), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Metal industry, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Waste disposal, Demography.
Identifiers: *Air quality data, *Pittsburg (Pennsylvania), Allegheny County (Pennsylvania), Beaver County (Pennsylvania), Washington County (Pennsylvania), Westmoreland County (Pennsylvania).

A report is presented of the results of an emission inventory of air pollutant sources in the Pittsburgh, Pennsylvania, Metropolitan Area. A modified version of the rapid survey technique was used. The objectives of the study were to determine the total quantities of the various air pollutants emitted and to estimate their seasonal and geographical variation. To accomplish this task, the study area was divided into a grid coordinate system, and the emission quantities were reported in terms of tons of pollutant per grid for a summer, winter, and average day. The pollutants considered were sulfur oxides, particulates, carbon monoxide, nitrogen oxides and hydrocarbons. All major source categories except solvent evaporation were included in the survey. (Author)

PB-207 684
Environmental Protection Agency, Durham, N.C. Air Pollution Control Office.
BILLINGS, MONTANA AREA AIR POLLUTANT EMISSION INVENTORY,
David S. Kircher. Jan 71, 60p APTD-0808

Descriptors: (*Air pollution, *Montana), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Billings (Montana), Stillwater County (Montana), Yellowstone County (Montana), Carbon County (Montana).

A summary of the emission inventory for the Billings, Montana Metropolitan Area is presented. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area, which was chosen on the basis of the size and distribution of its population and its air pollution sources, consists of three counties. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 685
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
BEAUMONT - PORT ARTHUR METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
David V. Mason. Mar 70, 59p APTD-0810

Descriptors: (*Air pollution, *Texas), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Petroleum industry, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Port Arthur (Texas), *Beaumont (Texas), *Orange (Texas), Hardin County (Texas), Jasper County (Texas), Jefferson County (Texas), Newton County (Texas), Orange County (Texas).

A summary is presented of the emission inventory for the Beaumont-Port Arthur Metropolitan Area, Texas. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area, which was chosen on the basis of the distribution of population and air pollution sources, consists of five counties surrounding the cities of Beaumont - Port Arthur and Orange. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes and evaporative losses. (Author)

PB-207 686
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
ATLANTA AIR POLLUTANT EMISSION INVENTORY,
David V. Mason. Oct 69, 57p APTD-0811

Descriptors: (*Air pollution, *Georgia), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Atlanta (Georgia), Fulton County (Georgia), Dekalb County (Georgia), Cobb County (Georgia), Henry County (Georgia), Gwinnett County (Georgia), Clayton County (Georgia), Douglas County (Georgia).

A report is presented of the emission inventory of the Atlanta Metropolitan Area, Georgia. Estimates are provided of total emissions of oxides of sulfur, oxides of nitrogen, hydrocarbons, carbon monoxide and particulate matter. The emissions of these pollutants are delineated with respect to source type, season of the year as well as their geographical distribution with the area. These surveys are also intended to determine the present level of emissions and status of their control. The general procedure for the survey is based on the rapid survey technique. The emissions are expressed in terms of tons of pollutants for an average annual, summer, and winter day. (Author)

PB-207 687
National Air Pollution Control Administration, Durham, N.C.
CHEYENNE, WYOMING AREA AIR POLLUTANT EMISSION INVENTORY,
David S. Kircher. Jul 70, 61p APTD-0813

Descriptors: (*Air pollution, *Wyoming), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Cheyenne (Wyoming), *Laramie (Wyoming), Albany County (Wyoming), Platte County (Wyoming), Goshen County (Wyoming), Laramie County (Wyoming).

A summary report is presented of the emission inventory for the Cheyenne, Wyoming Metropolitan Area. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, oxides of nitrogen, particulates, carbon monoxide, and hydrocarbons are delineated with respect to source type, seasonal variation and geographical distribution within the area. The Study Area which was chosen on the basis of population and air pollution sources, consists of four counties in the southeastern corner of the state of Wyoming. A grid coordinate system was used to show geographic distribution of the emissions within the Study Area. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 688
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
FRANKLIN COUNTY, OHIO AIR POLLUTANT EMISSION INVENTORY,
James R. Beaty, and David S. Kircher. Dec 70, 56p APTD-0814
Report on Columbus, Ohio Metropolitan Area Air Pollutant Emission Inventory.

Descriptors: (*Air pollution, *Ohio), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Franklin County (Ohio), *Columbus (Ohio).

A summary of the emission inventory is presented for the Columbus, Ohio Metropolitan Area. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides, are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area which was chosen for its topographic characteristics consists of Franklin County in which Columbus is centrally located. A grid coordinate system was used to show the geographical distribution of emissions within the county. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 689
National Air Pollution Control Administration, Durham, N.C.
EL PASO METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Keith A. Bakke. May 70, 69p APTD-0815

Descriptors: (*Air pollution, *Texas), (*New Mexico, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *El Paso (Texas), Dona Ana County (New Mexico), El Paso County (Texas), Grant County (New Mexico), Hudspeth County (Texas), Luna County (New Mexico), Otero County (New Mexico), Sierra County (New Mexico).

A summary is presented of the emission inventory for the El Paso Metropolitan Area. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area consists of 7 counties. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 690
National Air Pollution Control Administration, Durham, N.C.
FARGO-MOORHEAD METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY REPORT,
Keith A. Bakke. Mar 70, 59p APTD-0816

Descriptors: (*Air pollution, *North Dakota), (*Minnesota, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Com-

bustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Fargo (North Dakota), *Moorhead (Minnesota), Clay County (Minnesota), Cass County (North Dakota).

A summary is presented of the emission inventory for the Fargo - Moorhead Metropolitan Area. The report provides estimates of the present levels of air pollutant emissions and the status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area which was chosen on the basis of the distribution of population and air pollution sources, consists of two counties surrounding the cities of Fargo and Moorhead. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 691
National Air Pollution Control Administration, Durham, N.C.
HOUSTON-GALVESTON AIR POLLUTION EMISSION INVENTORY,
David V. Mason. Jul 69, 62p APTD-0818

Descriptors: (*Air pollution, *Texas), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Houston (Texas), *Galveston (Texas), Brazoria County (Texas), Chambers County (Texas), Fort Bend County (Texas), Galveston County (Texas), Harris County (Texas), Liberty County (Texas), Montgomery County (Texas), Waller County (Texas).

A summary is presented of the emission inventory of the Houston-Galveston Metropolitan Area. The report provides estimates of total emissions of oxides of sulfur, oxides of nitrogen, hydrocarbons, carbon monoxide, and particulate matter. The emissions of these pollutants are delineated with respect to source type, season of the year, and geographical distribution within the area. The study area was set up consisting of eight counties surrounding the cities of Houston and Galveston. The study area is divided into grid zones that serve as the basis for locating sources and reporting their emissions. The sources divided include industries, power plants, central refuse burning facilities, home heating, and on-site refuse burning. The emissions are expressed in terms of tons of pollutants for an average annual, summer, and winter day. (Author)

PB-207 692
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
MID CONNECTICUT-LOWER PIONEER VALLEY AIR POLLUTANT EMISSION INVENTORY,
Clyde B. Morita, and David S. Kircher. Jul 70, 74p APTD-0822

Descriptors: (*Air pollution, *Connecticut), (*Massachusetts, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data.

A summary report is presented of the emission inventory for the Mid-Connecticut Lower Pioneer Valley. The survey provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area, which was chosen on the basis of the distribution of population and air pollution sources, consists of 103 cities and towns in portions of Connecticut and Massachusetts. A grid coordinate system was used to show the geographical distribution of emissions within the area. All sources of emissions were classified into four categories: transportation, stationary fuel combustion, solid-waste disposal, and industrial processes. Emissions were estimated by using various indicators such as fuel consumption, refuse burining rates, vehicle-miles, production data, and control efficiencies and emission factors relating these indicators to emission rates. (Author)

PB-207 693
National Air Pollution Control Administration, Durham, N.C.
NEW ORLEANS METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Alan J. Hoffman. Oct 69, 55p APTD-0823

Descriptors: (*Air pollution, *Louisiana), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *New Orleans (Louisiana), Jefferson County (Louisiana), Orleans County (Louisiana), Saint Bernard County (Louisiana), Saint Charles County (Louisiana), Saint John the Baptist County (Louisiana), Saint Tammany County (Louisiana).

A summary is presented of the emission inventory for the New Orleans, Louisiana, Metropolitan Area. The report provides estimates of total emissions of oxides of sulfur, oxides of nitrogen, hydrocarbons, carbon monoxide, and particulate matter. The emissions of these pollutants are delineated with respect to source type, season of the year as well as their geographical distribution within the area. The Study Area consisted of six parishes surrounding the city of New Orleans. The Study Area is divided into grid zones that serve as the basis for locating sources and reporting their emissions. All emissions were divided into the following categories: fuel combustion in stationary sources, solid-waste disposal, industrial process losses, and evaporative losses. (Author)

PB-207 694
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
OKLAHOMA CITY METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Michael J. McGraw. Feb 70, 68p APTD-0825

Descriptors: (*Air pollution, *Oklahoma), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Oklahoma City (Oklahoma), Canadian County (Oklahoma), Cleveland County (Oklahoma), Grady County (Oklahoma), Kingfisher County (Oklahoma), Lincoln County (Oklahoma), Logan County (Oklahoma), McClain County (Oklahoma), Oklahoma County (Oklahoma), Pottawatomie County (Oklahoma).

A summary report is presented of the emission inventory for the Oklahoma City Metropolitan Area. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area, which was chosen on the basis of the distribution of population and air pollution sources, consists of nine counties surrounding Oklahoma City. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 695
National Air Pollution Control Administration, Durham, N.C.
OMAHA METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Alan J. Hoffman. Feb 70, 66p APTD-0826

Descriptors: (*Air pollution, *Nebraska), (*Iowa, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: Air quality data, *Omaha (Nebraska), Cass County (Nebraska), Dodge County (Nebraska), Douglas County (Nebraska), Sarpy County (Nebraska), Saunders County (Nebraska), Washington County (Nebraska), Pottawattamie County (Iowa), Mills County (Iowa).

A summary report is presented of the emission inventory for the Omaha Council Bluffs Metropolitan Area. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area, which was chosen on the basis of the distribution of population and air pollution sources, consists of six counties surrounding the city of Omaha in Nebraska and two counties in Iowa. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 696
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
PHOENIX-TUCSON METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Clyde B. Morita. Oct 69, 56p APTD-0827

Descriptors: (*Air pollution, *Arizona), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Phoenix (Arizona), *Tucson (Arizona), Cochise County (Arizona), Gila County (Arizona), Graham County (Arizona), Greenlee County (Arizona), Maricopa County (Arizona), Pima County (Arizona), Pinal County (Arizona), Santa Cruz County (Arizona).

A summary report is presented of the emission inventory for the Phoenix - Tucson Metropolitan Area, Arizona. The report provides estimates of the present levels of air pollutant emissions and

status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area, which consists of eight counties located in the southern part of the State of Arizona, is divided into grid zones that serve as the basis for locating sources and reporting their emissions. All sources of emissions were classified into the following categories: transportation, fuel combustion in stationary sources, solid-waste disposal, industrial process losses, organic solvent evaporation, and agricultural operations. (Author)

PB-207 697
National Air Pollution Control Administration, Durham, N.C.
RENO METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Michael J. McGraw. Aug 70, 48p APTO-0829

Descriptors: (*Air pollution, *Nevada), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disp. al, Demography.
Identifiers: *Air quality data, *Reno (Nevada), *Carson City (Nevada), Washoe County (Nevada), Storey County (Nevada), Lyon County (Nevada), Douglas County (Nevada).

A summary of the emission inventory for the Reno, Nevada Metropolitan Area is presented. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area consists of five counties surrounding Reno and Carson City. All sources of emissions were classified into five categories: transportation, stationary fuel conbustion, solid-waste disposal, industrial processes and evaporative losses. (Author)

PB-207 698
National Air Pollution Control Administration, Raleigh, N.C. Div. of Air Quality and Emission Data.
SALT LAKE CITY, PROVO, AND OGDEN METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
David V. Mason. Feb 70, 63p APTD-0830

Descriptors: (*Air pollution, *Utah), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Salt Lake City (Utah), *Provo (Utah), *Ogden (Utah), Box Elder County (Utah), Cache County (Utah), Davis County (Utah), Salt Lake County (Utah), Tooele County (Utah), Utah County (Utah), Weber County (Utah).

A summary is presented of the emission inventory for the Salt Lake City Metropolitan area, Utah. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year and geographical distribution within the area. The Study Area which 2as chosen on the basis of the distribution of population and air pollution sources, consists of seven counties surrounding the cities of Salt Lake City, Provo and Ogden. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes and evaporative losses. (Author)

PB-207 699
National Air Pollution Control Administration, Raleigh, N. C. Div. of Air Quality and Emission Data.
TREASURE VALLEY, IDAHO AREA, AIR POLLUTANT EMISSION INVENTORY,
David S. Kircher. Jun 70, 60p APTD-0833

Descriptors: (*Air pollution, *Idaho), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Payette County (Idaho), *Canyon County (Idaho), *Ada County (Idaho), *Elmore County (Idaho), *Boise County (Idaho), *Gem County (Idaho).

A summary of the emission inventory for the Treasure Valley, Idaho Metropolitan Area is presented. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area, which was chosen on the basis of population distribution and air pollution sources, consists of six counties in the western portion of the state of Idaho. A grid system was used to show geographical distribution of emissions within each of the counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, industrial processes, refuse, and evaporative losses. (Author)

PB-207 700
TRW Systems, Redondo Beach, Calif.
AIR QUALITY IMPLEMENTATION PLAN FOR THE STATE OF ALASKA. VOLUME I. CONTROL STRATEGY.

Dec 71, 102p 18425.007 APTD-0926
Contract DI-68-02-0048

Descriptors: (*Air pollution, *Alaska), (*Government poliicies, Air pollution), Regulations, Planning, State government, Abatement, Sulfur oxides, Particles, Carbon monoxide, Nitrogen oxides, Oxidizers, Hydrocarbons, Combustion products, Industrial wastes, Transportation, Fuels, Strategy, Sources, Inventories, Standards, Ice fog.
Identifiers: *Implementation Air Pollution Planning Program, *Air quality data, *Air pollution standards, Air pollution abatement.

The report presents a control strategy designed to achieve and maintain air quality in Alaska that is within the National Ambient Air Quality Standards. The control strategy consists of a set of control measures and procedures to be carried out and enforced by the State and Regional Air Quality Control Agencies. The document presents a technical summary of the Strategy. Section 1 presents an executive summary of the Strategy. It describes briefly the air quality problem in Alaska, it discusses the background for the problem solution and presents the control strategy. The subsequent four sections treat details of control Strategies for each of the four Alaska Air Quality Control Regions. These sections present, for each region, the region description, the existing regional air quality, the sources of pollutants, the proposed control strategy and finally the economic aspects of the control Strategy. (Author)

PB-207 701
Envirogenics Co., El Monte, Calif.
COMBINED FIRING SYSTEMS FOR SPECIFIC METROPOLITAN AREAS.
Final rept.,
R. M. Roberts, and R. C. Hanson. Nov 71, 108p*
F-0303 APTD-0951
Contract EPA-EHSD-71-9

Descriptors: (*Waste heat boilers, *Incinerators), (*Refuse disposal, Urban areas), (*Heat recovery, Incinerators), (*Refuse, *Fuels), Air pollution, Garbage disposal, Sulfur, Design criteria, Cost estimates, Operating costs, Capital costs, Pennsylvania, Ohio, Steam electric power generation, Combustion products.
Identifiers: *Low sulfur fuels, *Solid waste disposal, *Air pollution control, Philadelphia (Pennsylvania), Cleveland (Ohio).

The purpose of the present study was to develop for two major cities, design recommendations and procedures for the disposal of refuse, a low sulfur fuel, with heat recovery in utility grade boilers. An earlier study in this area resulted in the identification of optimal system design configurations and quantification of benefits to the environment and the economy. The program has applied that knowledge to specific case study areas. Arrangements with two cities having high SO2 burdens and growing solid waste burdens were made; these were Philadelphia, Pennsylvania, and Cleveland, Ohio. Information required for the study was collected and analyzed. Specific design packages were then developed for each city. The report presents projections describing the future nature of the city refuse-fuel inventories, specific recommendations as to plant types, sizes, and sites, cost analyses of operations involving the utilization of such systems, and estimated reduction in SO2 and particulate emissions. From these data, the conclusion can readily be drawn that the systems recommended would be more cost-effective than the methods that are now in use. (Author)

PB-207 706
Mount Sinai School of Medicine, New York.
AFTERLOADING IN RADIOTHERAPY. PROCEEDINGS OF A CONFERENCE HELD IN NEW YORK CITY, MAY 6-8, 1971,
Norman Simon, and Gail D. Schmidt. Dec 71, 510p
FDA-72-8024, BRH/DMRE-72-4
Contract PHS-68-05-0001
Sponsored in part by the Page and William Black Postgraduate School of Medicine, and the City University of New York.
Paper copy available from GPO $3.75 as stock no. 1715-0034.

Descriptors: (*Radiotherapy, Meetings), (*Radiation hazards, Radiotherapy), Malignant neoplasms, Therapy, Radium, Dosimetry, Exposure, Radiation dosage, Computers.
Identifiers: Afterloading.

These proceedings include the formal presentations, edited transcripts of the discussions, and an appendix containing presentations by representatives of commercial suppliers of afterloading materials and equipment. The first session of the conference was devoted to discussions of the hazards of radium and radium substitutes in the treatment of cancer, the development and current status of afterloading techniques in various nations, and the use of computers in radiotherapy. Speakers at the second session discussed dosimetry, treatment of cancer of the uterus, and interstitial techniques. In the third session, there was an open discussion on standardization of afterloading sources.

PB-207 747
National Air Pollution Control Administration, Durham, N.C. Air Quality and Emission Data Program.
CHARLOTTE METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY.
Michael J. McGraw. May 70, 81p APTD-0812

Descriptors: (*Air pollution, *North Carolina), (*South Carolina, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles,

Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Charlotte (North Carolina), Cabarrus County (North Carolina), Catawba County (North Carolina), Cleveland County (North Carolina), Gaston County (North Carolina), Iredell County (North Carolina), Lincoln County (North Carolina), Mecklenburg County (North Carolina), Rowan County (North Carolina), Union County (North Carolina), Chester (South Carolina), Lancaster (South Carolina), York (South Carolina).

A summary report is presented of the emission inventory for the Charlotte Metropolitan Area in North and South Carolina. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides, are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area which was chosen on the basis of the distribution of population and air pollution sources, consists of twelve counties surrounding Charlotte. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 748
National Air Pollution Control Administration, Durham, N.C. Air Quality and Emission Data Program.
LAS VEGAS METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Michael J. McGraw. May 70, 59p APTD-0819

Descriptors: (*Air pollution, *Nevada), (*California, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Las Vegas (Nevada), Clark County (Nevada), Mohave County (Nevada), Nye County (Nevada), San Bernadino County (California).

A summary of the emission inventory is presented for the Las Vegas Metropolitan Area. The report provides estimates of the present levels of air pollutant emissions and the status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area, which was chosen on the basis of the distribution of population and air pollution sources, consists of portions of four counties surrounding Las Vegas. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 749
Environmental Protection Agency, Durham, N.C. Air Pollution Control Office.
NEW YORK STATE SOUTHERN TIER WEST EMISSION INVENTORY,
James R. Beaty. Feb 71, 77p APTD-0824

Descriptors: (*Air pollution, *New York), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, Allegany County (New York), Cattaraugus County (New York), Chautaugus County (New York), Chemung County (New York), Schuyler County (New York), Steuben County (New York), Tompkins County (New York).

A summary report is presented of the emission inventory for the New York State Southern Tier West Area. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area, which was chosen on the basis of the distribution of population and air pollution sources, consists of seven counties in southwest New York. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 750
Environmental Protection Agency, Research Triangle Park, N.C. Air Pollution Control Office.
SAN JUAN, PUERTO RICO METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
David S. Kircher. Jan 71, 64p APTD-0831

Descriptors: (*Air pollution, *Puerto Rico), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *San Juan (Puerto Rico).

A summary report is presented of the emission inventory for the San Juan, Puerto Rico Metropolitan Area. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants, which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides, are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area is comprised of nine municipalities surrounding San Juan. A grid coordinate system was used to show the geographical distribution of emissions within the municipalities. All sources of emissions were classified into one of five categories: transportation, stationary fuel combustion, solid waste disposal, industrial process losses, and evaporative losses. (Author)

PB-207 751
Environmental Protection Agency, Durham, N.C. Air Pollution Control Office.
SIOUX FALLS, SOUTH DAKOTA METROPOLITAN AREA AIR POLLUTION EMISSION INVENTORY,
Carl V. Spangler, and George M. Duggan. Jan 71, 63p APTD-0832

Descriptors: (*Air pollution, *South Dakota), (*Minnesota, Air pollution), (*Iowa, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Sioux Falls (South Dakota), McCook County (South Dakota), Turner County (South Dakota), Lincoln County (South Dakota), Minnehaha County (South Dakota), Rock County (Minnesota), Lyon County (Iowa).

A summary report is presented of the emission inventory for the Sioux Falls, South Dakota Metropolitan Area. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons, and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The Study Area which was chosen on the basis of distribution of population and air pollution sources, consists of six counties surrounding Sioux Falls. The grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were classified into five categories: transportation, stationary fuel combustion, solid-waste disposal, industrial processes, and evaporative losses. (Author)

PB-207 752
National Air Pollution Control Administration, Durham, N.C. Air Quality and Emission Data Program.
WILLAMETTE VALLEY METROPOLITAN AREA AIR POLLUTANT EMISSION INVENTORY,
Alan J. Hoffman. Mar 70, 82p APTD-0836

Descriptors: (*Air pollution, *Oregon), (*Washington (State), Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, Willamette Valley, *Eugene (Oregon), *Salem (Oregon), *Portland (Oregon), *Vancouver (Washington).

A summary is presented of the emission inventory for the Willamette Valley, Oregon Metropolitan area. The report provides estimates of the present levels of air pollutant emissions and status of their control. The pollutants which include sulfur oxides, particulates, carbon monoxide, hydrocarbons and nitrogen oxides are delineated with respect to source type, season of the year, and geographical distribution within the area. The study area which was chosen on the basis of the distribution of population and air pollution sources, consists of 10 counties in the State of Oregon which included the cites of Portland, Salem and Eugene and 5 counties in the State of Washington. A grid coordinate system was used to show the geographical distribution of emissions within counties. All sources of emissions were divided into six categories: transportation, stationary fuel combustion, industrial processes, refuse and evaporative losses and miscellaneous combustion. (Author)

PB-207 765
Federal Water Pollution Control Administration, Cincinnati, Ohio. Analytical Quality Control Lab.
AUTOMATIC BEAKER SAMPLE CHANGER.
Evaluation rept. no. 1,
L. B. Lobring, and R. L. Booth. Jan 70, 8p W71-04192, EPA-16020-01/70

Descriptors: (*Chemical analysis, Automation), (*Water analysis, Automation), Performance evaluation, Tests, pH, Fluoride, Laboratory equipment, Electrochemistry.
Identifiers: Beaker Butler analyzer.

The Beaker Butler, manufactured by Vision Laboratories, Inc., Oriskany, New York, is a prototype sample changer that presents liquid samples to a variety of electrodes. To evaluate the potential use of this equipment for routine analyses, samples were analyzed using this equipment as well as manual methods. The results, which are included in tables, show that the automated step gave results comparable to manual methods with significant reduction in cost and man hours. (Author)

PB-207 850
Southwest Research Inst., San Antonio, Tex.
AN INVESTIGATION OF DIESEL POWERED VEHICLE ODOR AND SMOKE. PART II.
Final rept.,
Karl J. Springer. Feb 68, 156p SwRI-AR-644
APTD-0939
Contract PH-86-67-72
See also Part 3, PB-207 851.

Descriptors: (*Air pollution control equipment, Diesel engines), (*Diesel engines, *Exhaust gases), (*Odors, Diesel engines), (*Air pollution, Exhaust gases), (*Smoke abatement, Diesel engines), Smoke, Particles, Buses (Vehicles), Odor detection, Fuel additives, Odor control, Catalytic converters, Barium inorganic compounds, Exhaust systems, Gas analysis, Dynamometers, Acroleins, Nitrogen oxides, Aldehydes.
Identifiers: *Diesel exhaust, Catalytic reactors (Exhaust systems).

A ten-person odor panel, trained in the characterization of dilute diesel exhaust samples according to the PHS quality/intensity rating kit and the PHS light-extinction smokemeter, were used to measure odor and smoke. Evaluation was made of several two-cycle powered municipal buses equipped with automotive type catalytic devices. The smoke suppressing ability of a barium diesel fuel additive was successfully demonstrated in a five-truck fleet. Power rating had a pronounced effect on visible smoke output, although it appeared to have little or no effect on perceived odor. A limited study of the effect of injecting air in the exhaust at the underside of exhaust valves of a two-cycle powered municipal bus had a negligible effect, while a brief evaluation of the Jacobs engine brake also resulted in no noticeable change. Special studies were conducted and reported, including the effect of exhaust pipe size on smoke readings, preliminary studies of a tentative PHS smoke procedure, attempted evaluation of an electrostatic precipitator, and base line odor, smoke, and emissions from a municipal coach powered by a four-cycle V8 engine. (Author)

PB-207 851
Southwest Research Inst., San Antonio, Tex.
AN INVESTIGATION OF DIESEL-POWERED VEHICLE ODOR AND SMOKE. PART III.
Final rept.,
Karl J. Springer. Oct 69, 783p SwRI-AR-695
APTD-0940
Contract PH-22-68-23

Descriptors: (*Air pollution control equipment, Diesel engines), (*Diesel engines, *Exhaust gases), (*Air pollution, Exhaust gases), (*Odors, Diesel engines), (*Smoke abatement, Diesel engines), Smoke, Particles, Odor detection, Buses (Vehicles), Motor trucks, Electrostatic precipitators, Catalytic converters, Fuel additives, Odor control, Dynamometers, Acroleins, Carbon monoxide, Nitrogen oxides, Aldehydes, Tables (Data).
Identifiers: *Diesel exhaust, Catalytic reactors (Exhaust systems).

A ten-person odor panel, trained in the characterization of dilute diesel exhaust samples according to the PHS quality/intensity rating kit and the PHS light-extinction smokemeter, were used to measure odor and smoke. A commercially available diesel fuel odor additive had no effect on perceived odor from three two-cycle Detroit diesel 6V-71 E powered municipal buses, and inconsistent reductions in odor generally resulted from a catalytic muffler device. Both odor and smoke were less from similar buses powered by a 6V-71 N type engine. A number of truck-tractors with a variety of engines and drivelines were evaluated to develop dynamometer procedures and acquire limited baseline emissions. Due to low exhaust temperature and unsteady flow conditions with extended engine idle, the city bus exhaust represents one of the most difficult to treat by catalysis, and a number of catalytic devices employing both transition metal and precious metal catalyst coatings were unsatisfactory. An electrostatic precipitator was completely unsuccessful in reducing smoke. Fuel seemed to have little or no effect on perceived odor from three buses powered by 8V-71 N engines. (Author)

PB-207 870
Pacific Northwest Water Lab., Corvallis, Oreg.
THERMOELECTRIC GENERATORS POWERED BY THERMAL WASTE FROM ELECTRIC POWER PLANTS,
Mostafa A. Shirazi. Oct 70, 30p W72-06586, EPA-WQO-16130-10/70
Paper copy available from GPO $0.45 as EP2:10:1613-10/70.

Descriptors: (*Electric power generation, *Heat recovery), (*Thermoelectric power generation, Heat recovery), Thermal power plants, Feasibility, Flue gases, Heat exchangers, Cost estimates, Condensers (Liquefiers), Heat transfer.
Identifiers: Thermal pollution.

The feasibility of recovering electricity from the waste heat of electric power plants was assessed. Sources considered were: stack flue gas, gas-turbine exhaust, and condensing steam. Typical 1600 MW fossil-fuel steam plants and gas-turbine plants were used as examples. Flat plate heat exchangers were designed with thermoelectric couples arranged in series within the plates. Heat flux, conversion efficiencies, and flow friction losses were calculated. Except for the condenser application, the friction losses are several times the thermoelectric power generated. Under favorable conditions, 3 to 9 MW is obtainable from the thermoelectric condensers. The high material cost, however, precludes all such applications today. (Author)

PB-208 031
Vanderbilt Univ., Nashville, Tenn. Dept. of Environmental and Water Resources Engineering.
EFFECT OF GEOGRAPHICAL LOCATION ON COOLING POND REQUIREMENTS AND PERFORMANCE,
E. L. Thackston, and F. L. Parker. Mar 71, 242p W72-06618, EPA-16130-FDQ-03/71
Paper copy available from GPO $2.00 as EP2.10:16130FDQ03/71.

Descriptors: (*Lagoons (Ponds), *Heat budget), (*Water pollution, Heat), (*Cooling water, Lagoons (Ponds)), Distribution (Property), United States, Climate, Heat transfer coefficient, Industrial water, Electric power plants, Heat transfer.
Identifiers: *Thermal pollution.

The energy budget approach to cooling ponds has been outlined and applied. Monthly average weather data from 88 stations throughout the U.S. were used to calculate equilibrium temperatures, heat exchange coefficients, and amount of cooling in various sized ponds receiving the effluent from a standard power plant of 1000-mw capacity, both for average and extreme weather conditions. The data for each station are shown on a chart, and the variation of these results across the U.S. is depicted by a series of 28 maps of the U.S. with contours connecting equal values of the parameters. The results may also be used to estimate cooling pond performance for other sized power plants. The maps disclose variations across the U.S., on a given date, of up to 55F in equilibrium temperature, up to 100% difference in heat exchange coefficients, up to 50% difference in heat lost from a given sized pond, and up to 200% difference in the size of a pond necessary to produce an equal cooling effect. (Author)

PB-208 034
Tetra Tech, Inc., Pasadena, Calif.
MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATER WATER INTO LARGE BODIES OF WATER,
C. Y. Koh, and Loh-Nien Fan. Oct 70, 230p W72-06613, EPA-16130-DWO-10/70
Contract FWQA-14-12-570
Paper copy available from GPO $1.75 as EP2.10:16130-DWO-10/70.

Descriptors: (*Cooling water, Stream pollution), (*Water pollution, Heat), (*Stream pollution, Mixing), (*Temperature distribution, Stream pollution), Mathematical models, Lakes, Dispersing, Mixing, Temperature gradients, Computer programs, Diffusion, Industrial water, Jet mixing flow, Hydraulic models, Surfaces, Computer programs.
Identifiers: *Thermal pollution.

Mathematical models for heated water outfalls were developed for three flow regions. Near the source, the subsurface discharge into a stratified ambient water issuing from a row of buoyant jets was solved with the jet interference included in the analysis. The analysis of the flow zone close to and at intermediate distances from a surface buoyant jet was developed for the two-dimensional and axisymmetric cases. Far away from the source, a passive dispersion model was solved for a two-dimensional situation taking into consideration the effects of shear current and vertical changes in diffusivity. A significant result from the surface buoyant jet analysis is the ability to predict the onset and location of an internal hydraulic jump. Prediction can be made simply from the knowledge of the source Froude number and a dimensionless surface exchange coefficient. Parametric computer programs of the models are also developed. (Author)

PB-208 035
Dynatech Corp., Cambridge, Mass.
A SURVEY OF ALTERNATE METHODS FOR COOLING CONDENSER DISCHARGE WATER. OPERATING CHARACTERISTICS AND DESIGN CRITERIA.

Aug 70, 100p W72-06616, EPA-WQO-16130-DHS-08/70
See also PB-208 036.
Paper copy available from GPO $1.00 as Stock Number 5501-0128.

Descriptors: (*Electric power plants, Design criteria), (*Cooling water, Electric power plants), Site surveys, Fuels, Water pollution, Heat, Optimization, Cost estimates, Operating costs, Capital costs, Nuclear power plants, Condensers (Liquefiers), Steam electric power generation.
Identifiers: Thermal pollution.

The report is part of a larger study to perform a technical and economic survey of alternate methods for cooling condenser discharge water from thermal power plants. The criteria by which the power plants themselves are designed and optimized are described. These criteria are both technological and economic. The general aspects of power plant selection are reviewed. Design and cost optimization procedures are also reviewed. This includes capital costs for the turbine-generator units and for the boilers. Operating costs are computed based on constant incremental running rates. An example is carried to the point of a present worth evaluation. The use of feed-water heaters, and single- and multi-pressure condensers is described. Some operational considerations including instrumentation and control and plant layout are discussed briefly. (Author)

PB-208 036
Dynatech Corp., Cambridge, Mass.
A SURVEY OF ALTERNATE METHODS FOR COOLING CONDENSER DISCHARGE WATER. LARGE-SCALE HEAT REJECTION EQUIPMENT.

Jul 69, 131p W72-06617, EPA-WQO-16130-DHS-07/69

Contract FWQA-14-12-477
See also PB-208 035.
Paper copy available from GPO $1.25 as Stock Number 5501-0126.

Descriptors: (*Cooling water, *Heat exchangers), (*Cooling towers, Performance evaluation), (*Spray ponds, Cooling water), (*Electric power plants, Cooling water), (*Condensers (Liquefiers), Cooling water), Heat transfer, Rankine cycle, Cost estimates, Capital costs, Operating costs, Evaporators, Maintenance, Industrial water, Design criteria, Comparison, Water pollution, Heat, Lagoons (Ponds).
Identifiers: *Cooling ponds, *Thermal pollution, Water pollution control.

Various types of heat transfer equipment which would be applicable to the task of dissipating condenser discharge heat from large power plants are identified. Their performance is analyzed, performance prediction methods are presented, and the capital and operating costs are given. Information including sizing procedures, capital and operating cost, duty maintenance requirements, and possible secondary pollution considerations are presented for candidate systems such as once-through cooling, cooling ponds, spray ponds, wet cooling towers, dry cooling towers, evaporation condensers, and air-cooled condensers. Operational considerations are discussed including the theory of operation. Criteria are developed for the selection of an optimum unit given a particular geographic location, capacity requirements, and economic constraints. (Author)

PB-208 100
National Research Council, Washington, D.C. Committees on Pollution Abatement and Control.
ABATEMENT OF NITROGEN OXIDES EMISSIONS FROM STATIONARY SOURCES.

1972, 63p* COPAC-4 APTD-0982
Contract CPA-70-48

Descriptors: (*Air pollution, *Nitrogen oxides), (*Combustion products, Nitrogen oxides), Reviews, Sources, Electric power plants, Industrial wastes, Atmospheric motion, Atmospheric composition, Combustion, Fuels, Furnaces, Design criteria, Fluidized bed processors, Gas turbines, Flue gases, Scrubbers, Gas sampling.
Identifiers: *Air pollution control.

A report is presented of a comprehensive study of nitrogen oxides emissions from stationary sources. The report discusses: the sources of nitrogen oxides; formation and control of emissions from combustion sources; stack-gas cleaning, formation and control of emissions from chemical operations, and sampling and analytical methods. it is hoped that the report will be useful in planning and coordinating the research, development, and demonstration programs required to meet the national need for cleaner air. (Author)

PB-208 154
Northwestern Univ., Evanston, Ill.
MATHEMATICAL MODELING AND COMPUTER SIMULATION FOR DESIGNING MUNICIPAL REFUSE COLLECTION AND HAUL SERVICES.
Final rept.,
S. Wersan, J. Quon, and A. Charnes. 1971, 447p*
EPA-SW-6R-G-71
Grant PHS-UI-00699

Descriptors: (*Refuse disposal, Mathematical models), (*Collection methods, Refuse disposal), Computerized simulation, Hauling, Cost estimates, Systems analysis, Waste disposal, Optimization, Site surveys, Illinois, Computer programs, Operating costs.
Identifiers: *Solid waste disposal, Chicago (Illinois), Winnetka (Illinois).

Current solid waste collection practices do not differ significantly from those used at the turn of the century. This lag in the development of new technologies has had a marked economic impact. Ways must be found, therefore, to maximize efficiency while minimizing costs. The first part of the report concentrates on the haul operation through a study of mathematical models for the location or selection of disposal sites and the allocation of collection territories thereto. The second part is concerned with an operational analysis of the collection and haul operations combined, done with the use of two computer programs expecially written for the simulation of the operation of refuse systems. (Author)

PB-208 204
Wyoming Univ., Laramie. Dept. of Civil Engineering. Climate Areas.
SUPPLEMENTARY AERATION OF LAGOONS IN RIGOROUS CLIMATE AREAS.
Water pollution control research series,
Robert L. Champlin. Oct 71, 76p W7206838, EPA-17050-DVO-10/71
Paper copy available from GPO $0.75 as EP2.10:17050DVO-10/71.

Descriptors: (*Sewage treatment, *Cold weather tests), (*Lagoons (Ponds), Sewage treatment), Aeration, Design, Biochemical oxygen demand, Settling, Performance evaluation.

A pilot scale field investigation of the effects of supplemental aeration on waste stabilization lagoons was conducted at Laramie, Wyoming, a low temperature, high altitude area. Both batch and complete mixed experiments were conducted using constant air flows. Loading rates, both hydraulic and process, were varied. The supplemental aeration provided both aeration and mixing, thereby increasing metabolic rates. BOD reductions varied from 72 to 85% under three different loadings, at temperatures of less than 12C. No settleable solids were found in the effluent from the aerated system. Series operation was demonstrated to have the advantages of damping variations in quality parameters, providing for shock loading, and reducing coliform counts to minimum levels. (Author)

PB-208 205
MSA Research Corp., Evans City, Pa.
OPTIMIZATION OF THE REGENERATION PROCEDURE FOR GRANULAR ACTIVATED CARBON.
Water pollution control research series.
A. J. Juhola. Jul 70, 121p W72-06839 EPA17020-DAO-07/70
Contract EPA-14-12-469, EPA-14-12-107
Paper copy available from GPO $1.25 as EP2.10:17020 DAO--07/70.

Descriptors: (*Activated carbon, *Regeneration (Engineering)), (*Sewage treatment, *Activated carbon treatment), Drying, Pyrolysis, Activation, Leaching, Hydrochloric acid, Corrosion prevention, Particle size, Porosity, Ash content, Materials recovery.
Identifiers: Tertiary sewage treatment.

Laboratory scale experiments were conducted on the regeneration of activated carbons spent in tertiary treatment of wastewater. Wet spent carbon being regenerated thermally undergoes three regeneration stages: drying at about 220F; Pyrolysis of the adsorbed pollutants at 500 to 1550F; and Activation with flue gas and steam at 1600 to 1700F. Data indicated that alkaline and iron oxide ash accumulation catalyze the oxidation of carbon pores. Leaching with HCl was found to remove the metallic elements and allow regeneration to proceed with less destruction of the carbon. Other observations are discussed. (Author)

PB-208 206
Green Giant Co., LeSueur, Minn.
PILOT PLANT INSTALLATION FOR FUNGAL TREATMENT OF VEGETABLE CANNING WASTES.
Water pollution control research series.

Aug 71, 81p W72-06840, EPA-12060-EDZ-08/71
Paper copy available from GPO $1.00/copy as EP2.10:12060EDZ-08/71.

Descriptors: (*Byproducts, Food processing), (*Industrial waste treatment, *Food processing), (*Fermentation, Industrial waste treatment), (*Canning, Industrial waste treatment), Corn, Peas, Feeding stuffs, Harvesting, Lagoons (Ponds), Cost estimates, Pilot plants, Biochemical oxygen demand, Industrial wastes, Water pollution, Performance evaluation, Waste disposal.
Identifiers: *Water pollution control, *Mycelium, *Fungi imperfecti, *High protein supplements, Food supplements.

A pool unit with a 2 hp surface aerator and an oxidation ditch with a 3 ft rotary brush aerator, both containing the imperfect fungus, Trichoderma viride, were compared with a conventional aerated lagoon for efficiency in treating corn and pea wastes. With pH controlled at 3.7, ammonium nitrogen and inorganic phosphate were added, and the resultant residence time in the fungal systems was 20 hours. In the fungal systems, BOD5, COD, and TOC were reduced 96%, 88%, and 93% respectively for corn wastes and 95%, 81% and 87% respectively for pea wastes. The best recovery system was a vibrating screen for bulk harvest and a sand filter for smaller particles. Cost are given including profits from selling the mycelium as feed. (Author)

PB-208 208
Rand Development Corp., Cleveland, Ohio.
PHOSPHOROUS REMOVAL BY FERROUS IRON AND LIME.

Jan 71, 78p W72-06841, EPA-WQO-11010-EGO-01/71
Water Pollution Control Research Series. Prepared in cooperation with the County of Lake, Painesville, Ohio.
Paper copy available from GPO $0.75 as EP2.10:11010EGO-01/71.

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Sewage treatment, *Precipitation (Chemistry)), (*Pickling compositions, Sewage treatment), Iron chlorides, Calcium oxides, Settling, pH control, Suspended sediments, Cost estimates, Performance evaluation, Waste disposal, Industrial wastes.
Identifiers: Liquid waste disposal, Precipitants.

Spent pickle liquor, as a source of ferric ion, was added to primary treatment facilities and found to be effective in removing more than 60% of the phosphorus contained in the sewage. When advanced means for more complete removal of the insolubilized phosphates are available, removals in excess of 90% are indicated. In addition, overall suspended solids removals averaged 61.5% and BOD and COD removals averaged 61.6 and 55.3 percent during a 23 month test period. Required iron dosage ranged from the theoretical minimum of 2.7 to a maximum of approximately 3.1 weights of ferrous iron per weight of phosphorus. The weight increase in sludge solids due to chemical precipitation of phosphorus was 100 lbs/million gallons/mg/liter of phosphorus in the influent. Total costs for treating a raw sewage containing 13 mg/l phosphorus are given. (Author)

PB-208 209
National Canners Association, Berkeley, Calif. Western Research Lab.
DRY CAUSTIC PEELING OF TREE FRUIT FOR LIQUID WASTE REDUCTIONS.
Water pollution control research series,
Walter A. Mercer, Jack W. Ralls, and Harry J. Maagdenberg. Dec 70, 53p W72-06842, EPA-WQO-12060-FQE-12/70

Paper copy available from GPO $0.60 as EP2.10:12060FQE--12/71.

Descriptors: (*Fruits, *Peeling), (*Food processing, Fruits), (*Industrial wastes, Food processing), Waste water, Peaches, Pears, Quality, Biochemical oxygen demand, Water pollution, Alkalinity, Design.
Identifiers: Apricots, Dry caustic peeling, *Water pollution control.

Laboratory scale experiments in a 2 ton/hour experimental unit with peaches, pears, and apricots demonstrated that peel softened by hot solutions of sodium hydroxide can be removed efficiently by a series of rotating rubber discs. The quality of the peeled fruit prepared with the experimental unit compared favorably with fruit peeled in the conventional manner by commercial equipment, while peeling losses for all three fruits in the experimental unit were the same or slightly lower than those resulting from commercial peeling. During experimental peeling of peach halves, volume of wastewater discharged was 34.5 gallons per ton of pitted peaches as compared to 547 gallons per ton for conventional commercial peeling. (Author)

PB-208 210
Battelle Columbus Labs., Ohio.
AN INVESTIGATION OF TECHNIQUES FOR REMOVAL OF CYANIDE FROM ELECTROPLATING WASTES.
Water pollution control research series.

Nov 71, 94p W72-06843, EPA-WQO-12010-EIE-11/71
Grant WPRD-201-01-68
Paper copy available from GPO $1.00 as EP2.10:12010EIE-11/71.

Descriptors: (*Industrial waste treatment, *Electroplating), (*Water pollution, *Industrial wastes), (*Cyanides, Industrial wastes treatment), (*Activated carbon, Industrial waste treatment), Flotation, Zinc inorganic compounds, Vaporizing, Pilot plants, Performance evaluation, Chemical engineering, Regeneration (Engineering), Cost estimates, Capital costs, Operating costs.
Identifiers: *Water pollution control, Zinc cyanides.

Increasingly stringent stream discharge regulations have prompted an assessment of the current technology available for application to the metal finishing waste treatment problem, specifically in regard to smaller operations. Experimental laboratory and bench scale studies were then conducted on several unconventional wastewater treatment methods, including ion flotation, activated carbon adsorption, acidification volatilization, and solvent extraction. A demonstration pilot plant study was also conducted on the activated carbon process employing actual rinse waters from a zinc cyanide plating operation. The pilot scale activated carbon system was operated at 99% efficiency of cyanide removal, while providing for the complete recovery and regeneration of copper. Cost estimates for carbon sorption process are given. (Author)

PB-208 211
North Star Research and Development Inst., Minneapolis, Minn.
ULTRATHIN MEMBRANES FOR TREATING METAL FINISHING EFFLUENTS BY REVERSE OSMOSIS,
Water pollution control research series,
Lee T. Rozelle. Nov 71, 97p W72-06844, EPA-12010-DRH-11/71
Paper copy available from GPO $1.00 as EP2.10:12010 DRH--11/71.

Descriptors: (*Industrial waste treatment, *Metal finishing), (*Water pollution, *Industrial wastes), (*Osmosis, Industrial waste treatment), (*Membranes, Osmosis), Chromic acid, Nickel, Iron, Zinc, Copper, Cellulose acetate, Sulfonic acids, Polymeric films, Cellulosic resins, Electroplating, Hydrolysis, Cyanides, Performance evaluation, Supports, Casting, Chemical engineering.
Identifiers: *Water pollution control, *Reverse osmosis, Membrane supports, Glucans.

Seventeen different reverse osmosis membranes were evaluated as to their ability to separate heavy metal ions, acids, bases, and cyanides from metal finishing wastewaters. Although no one membrane was found to be effective for all effluents, membranes of 5 different polymers showed considerable promise. Simulated acidic nickel, iron, zinc, and copper plating bath rinses were effectively treated by ultrathin membranes of cellulose acetate, cellulose methyl sulfonate, O-propyl sulfonic acid, or B-glucan acetate diaminoethyl ether. The investigations have demonstrated that ultrathin membrane separation performance can be modified by: Modifying the chemical composition; Optimizing the annealing conditions; Producing as thin a membrane as practical; and Using a polysulfone support film. Preliminary engineering considerations for reverse osmosis applications to treatment and recycle of acidic copper plating bath rinse waters are presented. (Author)

PB-208 212
Crown Zellerbach Corp., Lebanon, Oreg. Lebanon Div.
AERATED LAGOON TREATMENT OF SULFITE PULPING EFFLUENTS.
Water pollution control research series.

Dec 70, 142p W72-06845, EPA-12040-ELW-12/70
Paper copy available from GPO $1.25/copy as EP2.10:12040-ELW-12/70.

Descriptors: (*Sulfite pulping, *Industrial waste treatment), (*Spent liquors (Pulping), Industrial waste treatment), Aeration, Lagoons (Ponds), Biochemical oxygen demand, Design, Performance evaluation, Operating costs, Water pollution, Temperature, Process variables.
Identifiers: *Water pollution control.

Weak washwater from a pulp mill, evaporator condensate from the spent liquor recovery system, and paper machine white water effluents were treated over a 17 month period in a secondary treatment plant consisting of 2 aeration basins. One basin was equipped with two 75 hp aerators and the other with six 25 hp aerators. Piping was designed to permit series and parallel operation of the two basins, and provisions were made to recycle treated waste. Series operation was superior to parallel operation for the wastes treated. The two 75 hp aerators were much more efficient in both mixing and aeration capacity than the smaller 25 hp units. An 80% BOD reduction in the system was achieved at a loading of 2.2 lbs BOD/hp-hr equivalent to a daily load of 16,000 lbs BOD. Total operating costs are discussed. (Author)

PB-208 213
Mead Corp., Chillicothe, Ohio.
MULTI-SYSTEM BIOLOGICAL TREATMENT OF BLEACHED KRAFT EFFLUENTS.
Water pollution control research series.

Dec 71, 272p W72-06846, EPA-120+0-EMY-12-71
Grant WPRD-55
Paper copy available from GPO $2.00 as EP2.10:12040 EMY--12/71.

Descriptors: (*Sulfate pulping, *Industrial waste treatment), (*Trickling filtration, Spent liquors (Pulping)), (*Spent liquors (Pulping), Industrial waste treatment), Sulfate pulps, Lagoons (Ponds), Pilot plants, Biochemical oxygen demand, Aeration, Clarification, Mathematical models, Water pollution, Performance evaluation, Process variables.
Identifiers: *Water pollution control.

Two high rate trickling filters packed with polyvinyl chloride media, an oxidation ditch with brush type aeration, and an earthen lagoon with mechanical surface aeration, were piped to allow them to be run in various combinations as multistage pilot scale treatment units for treatment of integrated kraft pulp and paper primary effluent. The combinations operated on normal strength wastewater included: Trickling filter in series (TF); TF to aerated lagoon (AL); Oxidation ditch (OD) to AL; and OD to TF. Elevation of the BOD5 from approximately 200 to 500 mg/l was accomplished by the addition of black liquor to the clarified effluent. The trickling filter with recycle performed slightly better than conventional trickling filters, reducing the BOD by 60 to 70%. 80% BOD5 removals were accomplished through short detention aerated lagoon treatment followed by clarification. Modeling of both the individual and combined treatment system was accomplished, but with only limited applicability. (Author)

PB-208 214
CRESA, Seattle, Wash.
POLLUTION ABATEMENT AND BY-PRODUCT RECOVERY IN SHELLFISH AND FISHERIES PROCESSING.
Water pollution control research series.

Jun 71, 82p W72-06847, EPA-12130-FJQ-06/71
Paper copy available from GPO $1.00/copy as EP2.10:12130-FJQ-06/71.

Descriptors: (*Industrial waste treatment, Food processing), (*Seafood, Industrial waste treatment), (*Water pollution, *Industrial wastes), (*Byproducts, Food processing), Alaska, Food additives, Crabs, Shellfish, Marketing, Economic analysis, Materials recovery, Fertilizers, Cost estimates, Proteins, Industrial plants, Design, Shrimps, Polysaccarides.
Identifiers: *Water pollution control, *High protein supplements, Food supplements, Chitins, Pet food, Kodiak (Alaska).

Seventy million pounds of seafood wastes, mainly from crab, salmon, and shrimp fishing, containing 22.1 million pounds of COD were discharged to Kodiak Harbor, Alaska in 1970. Aprivate firm was engaged to develop a plan to permit development of beneficial uses for the wastes while concurrently reducing the pollutional load on the harbor. The plan included collection and transportation of the waste to a central processing site on Near Island for by-product recovery. Shellfish wastes would be extracted with dilute alkali to yield a high quality protein and a chitin-calcium carbonate residue, the former to be used as pet food aditives or for industrial applications, and the latter to be exported for conversion to chitin and derived products or used in Alaska as a soil liming and fertilizer material. Fish wastes would also be extracted to yield a concentrated protein product similar to fish solubles oil and bone meal. (Author)

PB-208 215
Macon Board of Water Commissioners, Ga.
COMBINED TREATMENT OF MUNICIPAL KRAFT LINERBOARD AND FIBERBOARD MANUFACTURING WASTES.
Water pollution control research series.

Feb 71, 128p W72-06848, EPA-11060-DPD-02/71
Paper copy available from GPO $1.25 as EP2.10:11060DPD-02/71.

Descriptors: (*Sulfate pulping, Industrial waste treatment), (*Spent liquors (Pulping), Industrial waste treatment), (*Sewage treatment, Wood wastes), (*Wood wastes, *Industrial waste treatment), Pilot plants, Biochemical oxygen demand, Nutrients, Chlorination, Cost estimates, Capital costs, Operating costs, Feasibility, Performance evaluation, Sludge disposal, Chlorination, Design.
Identifiers: *Water pollution control, Secondary sewage treatment.

An experimental 120 gpm pilot treatment plant was used to treat a combined waste composed of mu-

nicipal sewage, wastewater from a Kraft linerboard mill and wastewater from a groundwood-cold extraction caustic insulation board mill. The pilot plant included combined and/or separate primary sedimentation units, followed by one secondary system consisting of 24 to 30 hrs of extended aeration, and one high rate plastic media trickling filter followed by 12-15 hrs of aeration. The two secondary treatment systems operated in parallel, receiving one-half of the total flow in each, and both systems had secondary sedimentation and sludge return. The pilot plant achieved in excess of 90% BOD removal, with no supplemental nutrient additions needed. Total estimated operating and capital costs for the combined treatment are given. (Author)

PB-208 216
Milwaukee Sewerage Commission, Wis.
PHOSPHORUS REMOVAL WITH PICKLE LIQUOR IN AN ACTIVATED SLUDGE PLANT.

Mar 71, 148p W72-06850, EPA-11010-FLQ-03/71
Paper copy available from GPO $1.25 as EP2.10:11010FLQ-03/71.

Descriptors: (*Sewage treatment, Phosphorus), (*Phosphorus, *Chemical removal (Sewage treatment)), (*Pickling compositions, Chemical removal (Sewage treatment)), Activated sludge process, Iron sulfate, Precipitation (Chemistry), Feasibility, Waste disposal, Industrial wastes, Performance evaluation.
Identifiers: Precipitants, Liquid waste disposal.

Hot waste pickle liquor (ferrous sulfate) as an iron source was successful in precipitating phosphorus from solution in a 115 mgd East Plant of Milwaukee's Jones Island Activated Sludge Wastewater Treatment Plant. An 85 mgd section of the plant receiving the same influent was operated as a control. The East Plant with iron addition, achieved 91.3% removals (0.70 mg/l P effluent residual), while the control West Plant removed 83.1% (1.4 mg/l P residual). Comparison of efficiencies of purification, pH, alkalinity, and microscopic examinations of the sludge microorganism indicated that the addition of unneutralized waste pickle liquor did not adversely affect purification processes. (Author)

PB-208 217
Georgia Kraft Co., Rome. Research and Development Center.
TREATMENT OF SELECTED INTERNAL KRAFT MILL WASTES IN A COOLING TOWER.

Aug 71, 150p W72-06851, EPA-12040-EEK-08/71
Paper copy available from GPO $1.25/copy as EP2.10:12040-EEK-08/71.

Descriptors: (*Sulfate pulping, *Industrial waste treatment), (*Cooling towers, Industrial waste treatment), (*Spent liquors (Pulping), Industrial waste treatment), Industrial wastes, Industrial water, Cooling water, Aeration, Biochemical oxygen demand, Water pollution, Strippers, Process variables, Cost estimates, Capital costs, Operating costs.
Identifiers: *Water pollution control.

Cooling of pulp mill condensates, decker filtrate, turpentine decanter underflow and condenser waters from a barometric type evaporator produced the removal of 10,000 lbs BOD per day and an 8 to 10 mgd reduction in overall mill water needs for an 850 ton/day Kraft linerboard mill. The 25% to 30% BOD reduction is attributed to physical stripping of volatile components. No significant operational problems have occurred, and preliminary treatability studies have indicated that the cooling tower blowdown does not adversely affect biological treatment processes. Costs and savings are mentioned. (Author)

PB-208 218
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
POTATO WASTE TREATMENT.

Jul 68, 88p W72-06852, EPA-12060-03/68
Proceedings of a Symposium Jointly Sponsored by Federal Water Pollution Control Administration and Idaho Univ., Moscow, 8 Mar 68.

Descriptors: (*Water pollution, *Industrial wastes), (*Industrial waste treatment, *Food processing), Potatoes, Anaerobic processes, Pilot plants, Irrigation, Trends, Design, Meetings.
Identifiers: *Potatoe processing, *Water pollution control, Secondary sewage treatment.

Processing of potatoes has grown markedly during the past fifteen years, especially in the Western States. Unfortunately, waste production has increased as rapidly as the processing. Several of the nation's largest fishkills have resulted, in part, from this increasing wasteload. Research is being done on treatment of potato processing wastes by various interested parties. It is for this reason that the symposium was scheduled so that existing knowledge could be shared and the gaps identified so that future research and demonstration efforts will be properly channeled. (Author)

PB-208 220
Federal Water Pollution Control Administration, Cincinnati, Ohio.
DEEP WELLS FOR INDUSTRIAL WASTE INJECTION IN THE UNITED STATES. SUMMARY OF DATA.
Water pollution control research series,
D. L. Warner. Nov 67, 48p WP-20-10 W72-06907, EPA-17070-11/67

Descriptors: (*Waste disposal, *Injection wells), (*Industrial wastes, Waste disposal), Inventories, United States, Refineries, Chemical industry, Drug industry, Metal industry.
Identifiers: *Liquid waste disposal.

The report lists 110 industrial waste injection wells located in 16 states and gives some of their characteristics. Data include operator, location, date operation was begun, well depth, injection depth, rock type and the geological age, chemical and physical character of the injected waste, injection rate and pressure, and the source of information. A statistical analysis of the well data is given in a table, and a graph shows the number of wells placed in operation from 1950 to January 1967. About 82% of the injections wells are used by chemicals, petrochemical, and pharmaceutical products plants; refineries and natural gas plants; and metal products companies. (Author)

PB-208 236
Chuo Univ., Tokyo (Japan). Faculty of Science and Engineering.
RECENT DEVELOPMENTS IN DESULFURIZATION OF FUEL OIL AND WASTE GAS IN JAPAN (1972).

Jan 72, 92p* APTD-1066

Descriptors: (*Air pollution, *Sulfur dioxide), (*Air pollution control equipment, Sulfur dioxide), (*Japan, Air pollution), (*Fuel oil, *Desulfurization), Regulations, Flue gases, Reviews, Supply (Economics), Fuel consumption, Government policies, Cost estimates, Chemical engineering, Sulfur, Engineering diagrams, Scrubbers, Sodium sulfites, Ammonia, Calcium oxides, Absorbers (Equipment).
Identifiers: *Low sulfur fuels, *Air pollution control, Hydrodesulfurization, Wellman-Lord process, Waste gas recovery.

Desulfurization of fuel oil and stack gas is assuming growing importance in Japan as a result of the mounting imports of high-sulfur crude oil. The report describes the recent developments in desulfurization in Japan up to December 1971. The following aspects of the developments are described: Emission and regulation of SO2 in Japan; Outline of the recent developments; Desulfurization of heavy oil; Waste-gas desulfurization by wet process; Waste-gas desulfurization by dry process; and Economic aspects. (Author)

PB-208 237
AiResearch Mfg. Co., Los Angeles, Calif.
COMPACT CONDENSER FOR RANKINE CYCLE ENGINE.
Final rept.,
S. Wong, J. D. Duncan, D. W. Graumann, J. C. Gibson, and J. J. Killackey. Aug 71, 94p 71-7464 APTD-0959
Contract EPA-EHSH-70-123

Descriptors: (*Condensers (Liquefiers), Design criteria), (*Automobile engines, *Rankine cycle), Heat radiators, Heat transfer, Air pollution control equipment, Cooling fins, Design standards, Cost analysis.
Identifiers: Rankine cycle engines.

The goal of this study was to develop heat transfer designs or techniques that will allow construction of condensers for automobile Rankine-cycle engines that have frontal area, volume, and fan horsepower requirements which are not appreciably greater than those of present automobile radiators. The first phase of the study included a parametric study of air-side heat transfer surfaces using available heat transfer data. Plain, ring dimpled, and finned tubes as well as plain, strip, offset, louvered, wavy, and perforated plate-fin surfaces were evaluated. A perforated plate-fin gave the best analytical results when the fin thickness was changed from 0.012 in. to 0.004 in. A small test core utilizing the new perforated fin design was fabricated and tested. The performance of this core did not achieve the calculated performance. Ten more test cores were fabricated and tested with a range of perforation sizes and spacings. (Author)

PB-208 238
Environmental Protection Agency, Research Triangle Park, N. C. Office of Air Programs.
AN ANALYSIS OF THE ENERGY/FUELS SUPPLY AND DEMAND SITUATION IN SELECTED AIR QUALITY CONTROL REGIONS OF THE NORTHEAST CORRIDOR.

May 71, 127p* APTD-0977

Descriptors: (*Electric power demand, *Fuel consumption), (*Fuels, *Reserves), (*Supply (Economics), Fuels), Fossil fuels, Fuel oils, Residual oils, Natural gas, Thermal power plants, Nuclear power plants, Air pollution, Abatement, Fossil fuel deposits, Coal, Economic analysis, Demand (Economics), Taxes, Sulfur.
Identifiers: *Northeast Corridor, *Air pollution abatement, *Low sulfur fuels, Air pollution economics.

The report examines the energy requirements and supplies (especially fossil fuels) needed to jointly meet both energy and air quality requirements in seven air quality control regions within the Northeast Corridor during the 1970-1975 period. The Northeast Corridor includes the east coast of the United States from Boston to Washington. This area encompasses all or at least a major part of the air quality control regions of Boston, Providence, Hartford, New York, New Jersey, Philadelphia, Baltimore, and Washington. The essential purpose of the study is to identify major gap areas in near term fuel use and projected supply requirements considering both the need for energy and the need for environmental protection. An equally important objective is to provide recommendations with respect to specific steps needed to be taken in order to fill energy gaps in an environmentally acceptable manner as revealed by the study. (Author)

PB-208 239
Research Triangle Inst., Durham, N. C.
AN EVALUATION OF TECHNIQUES FOR THE MEASUREMENT OF LOW CONCENTRATIONS OF TRACE GASES IN THE ATMOSPHERE.
Final rept.,
Clifford E. Decker, James R. Smith, and Gordon C. Ortman. Feb 70, 90p APTD-0956
Contract CPA-22-69-109

Descriptors: (*Atmospheric composition, Gas analysis), (*Air pollution, *Gas analysis), (*Coulometers, Gas analysis), (*Chemiluminescence, Gas analysis), (*Marine atmospheres, Gas analysis), Ozone, Oxidants, Carbon monoxide, Methane, Trace elements, Calibration.
Identifiers: *Air pollution detection.

A research experiment was conducted from Wilmington, North Carolina to the vicinity of the equator and return. Ozone, total oxidant, carbon monoxide; and methane concentrations were measured and comparative evaluation of the chemiluminescent and coulometric techniques for measuring ozone and oxidant of low atmospheric concentrations was conducted. The results suggest that both the chemiluminescent and coulometric measurement techniques will provide useful data at the low concentrations found in a relatively unpolluted marine environment. The chemiluminescent meter is more reliable than the coulometric meter under the conditions encountered. Although a precise quantitive estimate of the accuracy of the two techniques cannot be made on the basis of the data obtained, the evidence indicates that the chemiluminescent technique is significantly more accurate. (Author)

PB-208 281
General Dynamics Corp., Groton, Conn. Electric Boat Div.
POTENTIAL ENVIRONMENTAL EFFECTS OF AN OFFSHORE SUBMERGED NUCLEAR POWER PLANT. VOLUME I.
Water pollution control research series.

Jun 71, 330p W72-06614, EPA-WQO-16130-GFI-06/71-Vol-1
Contract FWQA-14-12-918
See also Volume 2, PB-208 281.
Paper copy available from GPO $2.50 as stock no. 5501-0119.

Descriptors: (*Water pollution, *Radioactive contaminants), (*Nuclear power plants, Water pollution), (*Underwater structures, Nuclear power plants), Heat, Pressurized water reactors, Cooling water, Mixing, Marine biology, Site surveys, Offshore structures, Nuclear reactor accidents, Oceans, Ecology, Ocean currents, Plankton, Marine fishes.
Identifiers: *Thermal pollution, *Water pollution effects (Plants), *Water pollution effects (Animals), Loss of coolant accedents.

Potential environmental effects of wastes from an 1190-Mwe pressurized-water nuclear power plant, submerged 250-ft deep at four representative sites off the U.S. mainland, were studied. The thermal field of the plant's cooling water discharge, and the distribution of radionuclides in the sea, were analyzed. In every case, the thermal mixing zone (by the most stringent present standards) was found to end before either a surface or subsurface field was established, and to be much smaller than for a plant in shallower waters. The biological effects from normal radionuclides release and from that following a major accident are discussed. (Author)

PB-208 282
General Dynamics Corp., Groton, Conn. Electric Boat Div.
POTENTIAL ENVIRONMENTAL EFFECTS OF AN OFFSHORE SUBMERGED NUCLEAR POWER PLANT. VOLUME II.
Water pollution control research series.

Jun 71, 302p W72-06615, EPA-WQO-16130-GFI-06/71-Vol-2
Contract FWQA-14-12-918
See also Volume 1, PB-208 281.
Paper copy available from GPO $2.25 as stock no. 5501-0120

Descriptors: (*Water pollution, *Radioactive contaminants), (*Nuclear power plants, Water pollution), (*Underwater structures, Nuclar power plants), (*Marine biology, Site surveys), Heat, Pressurized water reactors, Ocean currents, Mixing, Oceans, Offshore structures, Atlantic Ocean, New York, Maine, Florida, California, Benthos, Plankton, Marine fishes, Fouling.
Identifiers: *Thermal pollution, *Water pollution effects (Animals), *Water pollution effects (Plants), New York Bight.

The report, a second of two volumes gives a descriptive treatise and collation of data on the representative offshore sites, which forms the basis for application of the analytical models to those sites, and for the assessment of the effects of power plant wastes on the marine biota. (Author)

PB-208 326
Bituminous Coal Research, Inc., Monroeville, Pa.
STUDIES OF LIMESTONE TREATMENT OF ACID MINE DRAINAGE. PART II.

Dec 71, 153p W72-06849, EPA-14010-EIZ012/71
Paper copy also available GPO $1.25 as EP2.10:14010 EIZ-12/71.

Descriptors: (*Mine waters, *Neutralization), (*Coal mines, Mine waters), (*Water pollution, Mine waters), (*Limestone, Neutralization), Iron inorganic compounds, Cost estimates, Aeration, Sludge disposal, Sludge drying, Performance evaluation, Precipitation (Chemistry), Particle size, pH control, Settling.
Identifiers: *Mine acid drainage, *Water pollution control.

Laboratory investigations have demonstrated the feasibility of using limestone in place of pure lime for treating acid mine drainage for the neutralization of acidity and removal of iron to acceptable limits. The process consists of: Equalization; Addition of pulverized limestone and mixing; Aeration; Slurry recirculation to the mixing area; Sludge settling; and Sludge dewatering and disposal. Total costs are given. Advantages and disadvantages of limestone over lime are also discussed.

PB-208 328
Ohio State Univ., Columbus. Center for Human Resource Research.
BLACK-WHITE DIFFERENCES IN ANNUAL HOURS OF WORK SUPPLIED BY MALES 45--59: A PROGRESS REPT.,
Karl A. Egge. May 71, 85p DLMA-81-37-70-18-1
Contract DL-81-37-70-18

Descriptors: (*Employment, Males), (*Ethnic groups, Statistical data), Economic surveys, Manpower utilization, Productivity, Motivation, Labor relations, Statistical distributions, Earnings, Economic models, Classifications, Age, Time.
Identifiers: *Black white comparisons, *Hours of work.

A study of a sample of male wage and salary workers who were 45 to 59 years old in 1966 investigated why whites supplied about 200 more hours of labor in 1965 than blacks. It is based on data from a longitudinal study of the labor force behavior of four age-sex groups; for reports on the first two surveys for this group of men, see PB 180530 and PB 192671. The measure of hours of work included time spent searching for a job or on layoff as well as time actually employed. The model used in the investigation related hours of work to eight factors: hourly wage rate; level of nonlabor income; age; local unemployment rate; recent unemployment experience; marital status; health; and type of job, such as blue collar, etc.

PB-208 329
TRW Systems Group, Redondo Beach, Calif.
AIR QUALITY IMPLEMENTATION PLAN FOR THE STATE OF ALASKA. VOLUME III. PERMIT SYSTEM APPENDICIES.

Dec 71, 13p TRW-18425.007-Vol-3-App APTD-0972
EPA-68-02-0048
See also Volume 3, PB-208 328 and Volume 4, PB-208 330.

Descriptors: (*Air pollution, *Alaska), (*Government policies, Air pollution), Licenses, Regulations, Planning, State government, Abatement, Construction, Industries, Forms (Paper).
Identifiers: *Implementation Air Pollution Planning Program, *Air pollution abatement.

The report presents three Appendices which support Volume III (PB-208 308), Permit System, of the Alaska Implementation Plan. Appendix A, provides definitions of terms used in the Permit System. Appendix B is a sample registration form for use in registering sources of air pollutants. Appendix C is an application form for authority to construct and/or permit to operate a source of air pollution. The main report of Volume III discusses the feautres of the Permit System. (Author)

PB-208 330
TRW Systems Group, Redondo Beach, Calif.
AIR QUALITY IMPLEMENTATION PLAN FOR THE STATE OF ALASKA. VOLUME IV. EMERGENCY EPISODE PLAN.

Dec 71, 49p TRW-18425.007-Vol-4 APTD-0973
EPA-68-02-0048
See also Volume 3 Appendices, PB-208 329 and Volume 4 Appendices, PB-208 331.

Descriptors: (*Air pollution, *Alaska), (*Government policies, Air pollution), Public health, Regulations, Planning, State government, Abatement, Sulfur oxidizes, Particles, Carbon monoxide, Nitrogen oxides, Oxiders, Hydrocarbons, Combustion products, Industrial wastes, Strategy, Sources, Weather forecasting, Warning systems.
Identifiers: *Air pollution episodes, *Air pollution public emergency limits, *Emergency planning, *Implementation Air Pollution Planning Program, Fairbanks (Alaska), Anchorage (Alaska).

The report presents the Emergency Episode Plan which defines contingency measures to be taken by designated agencies and state officials, in order to protect the health of persons during air pollution episodes. The plan consists of the following sections which are presented here: Legal authority; Episode Criteria, Episode Action Plan, Operational Procedures, Organizational Interfaces/Communications. From the evidence resulting from evaluation of air quality data and identification of major pollution sources, it is concluded that the threat of episodes are greatest in the follwoing three areas, at the present time: Total suspended particulates in Anchorage and Fairbanks, Carbon monoxide in Center City of Fairbanks, Oxides of sulfur in the Ketchikan Area. The Plan is designated as a mechanism for indicating public action, issuing public warning, and attempting to reduce levels of a specific pollutant concentration by reducing major source emissions. (Author)

PB-208 331
TRW Systems System, Redondo Beach, Calif.
AIR QUALITY IMPLEMENTATION PLAN FOR THE STATE OF ALASKA. VOLUME IV. EMERGENCY EPISODE PLAN APPENDICES.

Dec 71, 38p TRW-18425.007-Vol-4-App APTD-0974
EPA-68-02-0048

See also Volume 4, PB-208 330 and Volume 5, PB-208 332.

Descriptors: (*Air pollution, *Alaska), (*Government policies, Air pollution), Public health, Regulations, Planning, State government, Abatement, Sulfur oxides, Particles, Carbon monoxide, Nitrogen oxides, Oxidizers, Hydrocarbons, Sources, Weather stations, Warning systems, Laws (Jurisprudence).
Identifiers: *Air pollution episodes, Emergency planning, *Implementation Air Pollution Planning Program.

The document presents supporting material for Volume IV, Emergency Episode Plan of the Alaska Air Quality Implementation Plan. Appendix A, Laws of Alaska, presents laws establishing the Department of Environmental Conservation, defining its responsibilities, means and policies. Appendix B, Weather Station List for Alaska gives a compilation by the National Weather Service of effective weather stations in the Alaskan region. (Author)

PB-208 332
TRW Systems Group, Redondo Beach, Calif.
AIR QUALITY IMPLEMENTATION PLAN FOR THE STATE OF ALASKA. VOLUME V. SURVEILLANCE SYSTEM.

Dec 71, 71p TRW-18425.007-Vol-5 APTD-0975
Contract EPA-68-02-0048
See also Volume 4 Appendices, PB-208 331 and Volume 6, PB-208 333.

Descriptors: (*Air pollution, *Alaska), (*Government policies, Air pollution), Gas sampling, Regulations, Planning, State government, Abatement, Sulfur oxides, Particles, Carbon monoxide, Nitrogen oxides, Oxidizers, Hydrocarbons, Combustion products, Industrial wastes, Transportation, Strategy, Data processing.
Identifiers: *Implementation Air Pollution Planning Program, *Air pollution abatement, *Air pollution sampling.

Air quality sampling instruments, if operated on a regular schedule with consistent sampling and analytical procedures, will produce data to allow long-term trends and short-term excursions in air pollutant levels to be identified. By proper location of samplers, maximal and minimal (background) concentrations can be quantified, as well as pollutant levels near centers of population, hospitals and other areas of interest. The first part of the document contains descriptions of the existing air pollution control programs in the State of Alaska, detailed discussions of the existing air quality data, and a definition of an air quality surveillance program which will meet the minimum federal requirements as defined by the Federal Register. Then described are procedures which will be used in sample collection, sample analysis, and data handling. In the State of Alaska, it is important that the air quality monitoring program define the existing problems in such detail that cause- and-effect relationships can be developed to both solve existing problems and prevent the perpetuation of problems in the future. A section address this aspect of the surveillance program. Finally a timetable for completion and resource requirements is given. (Author)

PB-208 333
TRW Systems Group, Redondo Beach, Calif.
AIR QUALITY IMPLEMENTATION PLAN FOR THE STATE OF ALASKA. VOLUME VI. RESOURCES.

Dec 71, 51p TRW-18425.007-Vol-6 APTD-0976
Contract EPA-68-02-0048
See also Volume 3, Appendix, PB-208 329, Volume 5, PB-208 332.

Descriptors: (*Air pollution, *Alaska), (*Government policies, Air pollution), Resources, Manpower, Regulations, Planning, Abatement, Requirements, Cost estimates, Revenue, Licenses, Taxes.
Identifiers: *Implementation Air Pollution Planning Program, *Air pollution abatement.

The Implementation Plan for abatement, prevention, and control of air pollution within the State of Alaska will be of little use unless there are adequate resources available to execute the tasks outlined. The report presents a summary of these tasks, the resources available and the resources required to fully implement the plan. The summary includes: Manpower requirement estimates; Cost estimates; System startup and continuing operating resources estimates and; Revenue services. (Author)

PB-208 336
TRW Systems Group, Redondo Beach, Calif.
AIR QUALITY IMPLEMENTATION PLAN FOR THE STATE OF ALASKA. VOLUME I. CONTROL STRATEGY APPENDICES.

Dec 71, 118p TRW-18425.007-Vol-1 APTD-0970
EPA-68-02-0048
See also Volume 2, PB-208 337.

Descriptors: (*Air pollution, *Alaska), (*Government policies, Air pollution), Regulations, Planning, State government, Abatement, Sulfur oxides, Particles, Carbon monoxide, Nitrogen oxides, Oxidizers, Hydrocarbons, Combustion products, Industrial wastes, Transportation, Fuels, Strategy, Sources, Roads, Meteorological data, Dust control.
Identifiers: *Implementation Air Pollution Planning Program, Automobile exhaust, *Air pollution abatement, Fairbanks (Alaska), Anchorage (Alaska).

The document presents appendices which contain supportive data and calculations for the control measures presented in Volume I (PB-207 700), Control Strategy, of the Alaska Implementation Plan. The contents include: Air quality caused by particulate emission in anchorage; Variations in particulate concentrations with wind, rain and temperature; Seasonal variations in particulate; Road surface conditions in anchorage; Particulates and carbon monoxide in Fairbanks; Motor vehicle emissions in Fairbanks; Reduction in carbon monoxide automobile emissions; Emissions from fuel combustion; Rejected control measures; Carbon monoxide reduction due to automatic traffic signal control; Estimates of ground level concentration of SOX, CO, and particulates. (Author)

PB-208 337
TRW Systems Group, Redondo Beach, Calif.
AIR QUALITY IMPLEMENTATION PLAN FOR THE STATE OF ALASKA. VOLUME II. COMPLIANCE SCHEDULE.

Dec 71, 8p TRW-18425.007-Vol-2 APTD-0950
EPA-68-02-0048
See also Volume 1, PB-208 336 and Volume 3, PB-208 328.

Descriptors: (*Air pollution, *Alaska), (*Government policies, Air pollution), Regulations, Planning, State government, Abatement, Particles, Carbon monoxide, Combustion products, Industrial wastes, Transportation, Fuels, Strategy, Sources, Inspection, Dust control.
Identifiers: *Implementation Air Pollution Planning Program, *Air pollution abatement.

The document presents the schedule by which all sources will comply with the applicable portions of the control strategy of the Air Quality Implementation Plan for the State of Alaska. The schedule is such that all sources will be in compliance with the schedules applicable to the control strategy for attainment of the primary standards within three years of the date of approval of this Implementation Plan and for attainment of the secondary standards within a reasonable time thereafter. The document discusses: particulate controls; carbon monoxide controls; and the possibility of installing a surveillance system. (Author)

PB-208 345
General Electric Co., Philadelphia, Pa. Re-entry and Environmental Systems Div.
WATERCRAFT WASTE TREATMENT SYSTEM DEVELOPMENT AND DEMONSTRATION REPORT.

Sep 71, 135p W72-07099, EPA-15020-DHG-09/71
Contract EPA-14-12-522
Paper copy available from GPO $1.25 as EP2.10:15020. DHG-09/71.

Descriptors: (*Sewage treatment, *Ships), (*Coagulation, Sewage treatment), Electrochemistry, Iron inorganic compounds, Hydroxides, Coagulants, Comminution, Clarification, Activated carbon treatment, Incinerators, Performance evaluation, Field tests, Sludge disposal, Design.
Identifiers: *Shipboard sewage treatment systems, Iron hydroxides.

A shipboard sewage treatment system consisting of: Comminution of solids for ease of transport and further treatment; Electro coagulation of sewage for ease of removal of suspended solids; Solids separation; Soluble BOD reduction with carbon adsorption; Coliform bacteria removal; and Solids incineration was designed to process shipboard sanitary, culinary, and laundry wastes during prolonged sea trials. Advantages of the electrochemical system are given. Waste stream characterization showed the BOD and suspended solids levels of shipboard wastes to be 2 to 3 times the concentrations common to municipal wastes. The development program was successful in demonstrating a practical and economically viable electro-chemical treatment system. (Author)

PB-208 346
Rohrer (Karl R.) Associates, Inc., Akron, Ohio.
UNDERWATER STORAGE OF COMBINED SEWER OVERFLOWS.

Sep 71, 172p W72-07100, EPA-11022-ECV-09/71
Contract EPA-14-12-143
Paper copy available from GPO $1.50 as EP1.16:11022 ECV 09/71.

Descriptors: (*Combined sewers, Overflows), (*Overflows, *Underground storage), (*Sanitary engineering, Underground storage), Storm sewers, Storage tanks, Expandable structures, Site surveys, Design, Cost estimates, Capital costs, Operating costs, Settling, Water pollution, Performance evaluation, Ohio, Great Lakes.
Identifiers: *Storm water runoff, *Water pollution control, Sandusky (Ohio), Lake Erie.

Two 100,000 gallon collapsible tanks were anchored under water in Lake Erie to demonstrate, on a pilot scale, the feasibility of storing combined sewer storm overflow in underwater flexible tanks. Site selection, model testing, system design, construction, and one year's operation were included in the investigation. During the year's operation, 988,000 gallons of storm overflow were contained and returned to the treatment plant for treatment. Construction, operation, and maintenance costs are discussed. It was determined that for larger installations, modular systems of 250,000 to 500,000 gallon basic unit tanks should be employed, with site characteristics determining both the overall feasibility of the system, and the optimum tank size should such a system be feasible. Life expectancy for tank materials can only be determined in full scale operation in the actual environment. (Author)

PB-208 347
West Virginia Univ., Morgantown. Coal Research Bureau.

DEWATERING OF MINE DRAINAGE SLUDGE.

Dec 71, 92p EPA-14010-FJX-12/71, W72-07101
Paper copy available from GPO $1.00 as EP1.16:14010FJX 12/71.

Descriptors: (*Neutralizing, Mine waters), (*Mine waters, *Sludge drying), (*Water pollution, Mine waters), (*Coal mines, Mine waters), Water chemistry, Aeration, Lagoons (Ponds), pH, Thickening, Dewatering, Limestone, Precipitation (Chemistry), Thickeners (Equipment), Clarification, Settling.
Identifiers: *Mine acid drainage, Water pollution control.

Sludge formed by the neutralization of acid mine drainage is generally affected by the acid mine water composition and the method of neutralization used. The effects of both raw water chemistry and the various treatment processes on sludge composition are enumerated for each treatment process. The methods discussed include: Conventional lime neutralization; Mechanical aeration; Lagoon aeration; pH; and Sludge recirculation. Several other processes, described and studied in slightly more detail, include the High Density Sludge Process, the Densator Process, the Elpo Treatment Process, and the use of magnetic sludge. Methods of thickening, conditioning and dewatering are also presented, with vacuum filtration appearing as the most feasible. (Author)

PB-208 348
Southern Illinois Univ., Carbondale.
FEASIBILITY STUDIES OF APPLICATIONS OF CATALYTIC OXIDATION IN WASTEWATER.

Nov 71, 76p W72-07103, EPA-17020-ECI-11/71
Contract EPA-14-12-572
Paper copy available from GPO $0.75 as EP1.16:1702 ECI-11/71.

Descriptors: (*Sewage treatment, *Ultrasonic radiation), (*Industrial waste treatment, Ultrasonic radiation), (*Catalysts, Ultrasonic radiation), (*Phenols, Sewage treatment), Ozonization, Oxidation, Chlorine aromatic compounds, Nitro compounds, Nickel, Coliform bacteria.
Identifiers: *Sonochemistry, Tertiary sewage treatment, Raney nickel catalysts, *Benzene/chloro-nitro, *Water pollution control, Chemical oxygen demand.

The recent discovery of the synergistic effects of certain catalysts and ultrasound (sonocatalysis) prompted research investigating the feasibility of using sonocatalysis for advanced wastewater treatment. Sonocatalytic oxidation, sonocatalytic ozonation, and catalytic ozonation were tested individually on treatment plant effluent, and mechanistic studies of sonocatalysis were conducted concurrently using synthetic wastes. Insonation, activated Raney-Nickel catalyst, and air flow produced very large removals of COD, Oxygen Demand Index (ODI), and coliforms from treated waste-waters. Synthetic wastes of phenol and orthochloronitro benzene (OCNB) were prepared and the sonocatalytic ozonation studied. (Author)

PB-208 349
Kansas Univ./Center for Research, Inc., Lawrence.
OXYGEN CONSUMPTION IN CONTINUOUS BIOLOGICAL CULTURE.

May 71, 130p W72-07104, EPA-17050-DJS-05/71
Grant EPA-WP-01023-03
Paper copy available from GPO $1.25 as EP1.16:17050DJS 05/71.

Descriptors: (*Activated sludge process, *Aeration), (*Sewage treatment, Activated sludge process), Nutrents, Respiration, Dissolved gases, Oxygen, Design criteria, Mathematical models, Mixing.
Identifiers: Chemical oxygen demand.

To aid in the further development of sewage treatment by activated sludge, a continuous flow automatically recording respirometer was used to study the response of aeration only and aeration with sludge return completely mixed activated sludge systems (CMAS) to step changes in the influent substrate. The experiments were conducted at 25 C with glucose; a mixture of glucose, glutamate, and acetate; and a mixture of sewage solids plus Metrecal. Influent substrate concentrations were doubled in the 3-hour and tripled in the 6-hour mean residence time aeration only experiments without increasing the soluble COD in the effluent. Decreases in the influent substrate concentrations produced rapid decreases in the rate of oxygen utilization. A procedure for calculating the rate of oxygen uptake by a CMAS system at any time during a step transient was developed. (Author)

PB-208 411
Horizons, Inc., Cleveland, Ohio.
FOAM SEPARATION OF ACID MINE DRAINAGE.
Water pollution control research series.

Oct 71, 61p* W72-07102, EPA-14010-FUI-10/71
Contract EPA-14-12-876

Descriptors: (*Mine waters, *Flotation), (*Water pollution, Mine waters), Additives, Frothing, Chelates, Metals, Iron, Calcium, Magnesium, Manganese, Aluminum, Surfactants, Extraction, pH control, Cost estimates, Feasibility.
Identifiers: *Froth flotation, *Water pollution control, *Mine acid drainage.

Laboratory studies of continuous flow foam separation were conducted to determine the optimum conditions for maximum extraction of dissolved metal cations (Fe, Ca, Mg, Mn, and Al) from acid mine drainage. Foaming experiments were conducted in a 6 in.-diameter glass column capable of liquid flow rates of 3-12 gal. per hour. The approach to foam separation taken was the production of the persistent foams which allowed protracted foam drainage to reduce liquid carryover in the foam. The effects of pH, chelate addition, surfactant type and concentration, air sparging rate, metal concentration and foam drainage were investigated in relation to metal extration. Results show that sewage foamability is too low for foam separation alone to be a feasible sewage treatment method. (Author)

PB-208 433
Robert S. Kerr Water Research Center, Ada, Okla.
INVESTIGATIONS CONCERNING PROBABLE IMPACT OF NITRILOTRIACETIC ACID ON GROUND WATER.
Water pollution control research series,
William J. Dunlap, Roger L. Cosby, James F. McNabb, Bert E. Bledsoe, and Marion R. Scalf.
Nov 71, 59p W72-07223, EPA-16060-GHR-11/71
Paper copy available from GPO $0.60 as EP 2.10:16060-GHR-11/71.

Descriptors: (*Water pollution, *Chelates), (*Detergents, Water pollution), (*Ground water, Water pollution), Hydrology, Sources, Chelation, Metals, Biodeterioration, Adsorption, Soil chemistry, Aquifers, Labeled substances, Tracer studies, Acetic acid, Amines.
Identifiers: *Acetic acid/nitrilo-tri.

The fate and effect of NTA both in ground waters and in soil profiles overlying ground waters were studied using laboratory models. Sorption of NTA on soils slows its movement into and through ground waters. Sorption is not sufficient to prevent or greatly reduce potential pollution of ground water by NTA used as a detergent builder. NTA infiltrating through most unsaturated soils undergoes rapid and complete degradation and contributes only inorganic nitrogen compounds and carbonate to ground waters. NTA infiltrating through saturated soils experiences only very limited degradation, with a major portion entering ground water intact. Any NTA which escaped degradation during infiltration through soils could transport such metals as iron, zinc, chromium, lead, cadmium, and mercury from soils into ground waters. NTA would degrade slowly in essentially anaerobic ground-water environments. (Author)

PB-208 434
Pacific Northwest Water Lab., Corvallis, Oreg.
ECONOMIC ASPECTS OF THERMAL POLLUTION CONTROL IN THE ELECTRIC POWER INDUSTRY,
Alden G. Christianson, and Bruce A. Tichenor.
Sep 69, 16p Working Paper-67 W72-07246, FWPCA-16130-09/69

Descriptors: (*Electric power plants, *Cooling systems), (*Water pollution, Heat), Thermal power plants, Cooling water, Cost estimates, Rates (Costs), Economic analysis, Cooling towers, Lagoons (Ponds), Cost comparison.
Identifiers: *Thermal pollution, Water pollution control, *Water pollution economics, Cooling ponds.

Most new thermal power plants will use cooling devices. The economic impact of cooling, how it affects the power industry and the consumer, is discussed. Data and analyses show that the cost of providing thermal pollution control is not a restrictive factor in the production of electricity. Incremental increases in the production cost of electricity from plants with closed-cycle cooling over those with once-through fresh-water cooling are not excessive. More importantly, the impact of thermal pollution control on the consumer cost of electricity is minimal. (Author)

PB-208 435
Pacific Northwest Water Lab., Corvallis, Oreg.
EVALUATION OF WASTE TREATMENT SYSTEM: CHEMAWA INDIAN SCHOOL,
B. David Clark, and Kenneth A. Dostal. Jul 68, 63p PR-6 W72-07247, FWPCA-17050-07/68

Descriptors: (*Sewage treatment, Performance evaluation), Aeration, Lagoons (Ponds), Aerators, Biochemical oxygen demand, Water analysis, Oregon.
Identifiers: Chemawa Indian School.

The Bureau of Indian Affairs (BIA) operates a nine month school for 900-1,000 Indians at Chemawa, approximately two miles north of Salem, Oregon. The waste treatment plant for the school is unique in this area, consisting of a facultative mechanically aerated lagoon followed by a two-acre polishing pond and chlorination. A sampling program was established to determine raw waste load and characteristics; solids and BOD removal in aerated lagoon; sludge accumulation in aerated lagoons; MPN level in aerated lagoons; Adequacy of aerator for mixing and oxygenation; effect of polishing pond on BOD, DO, MPN and SS; effect of chlorination on BOD, DO, MPN and SS; and operation and maintenance costs and requirements. (Author)

PB-208 436
Pacific Northwest Water Lab., Corvallis, Oreg.
EVALUATION OF EXTENDED AERATION TREATMENT AT RECREATION AREAS.
Progress rept.,
B. David Clark. Mar 70, 94p Working Paper-68, PR-8 W72-07248, FWPCA-15010-03/70

Descriptors: (*Recreational facilities, *Sewage treatment), Activated sludge process, pH control, Aeration, Settling, Flow rate, Design criteria, Nitrification, Mountains, Beaches, Washington (State), Oregon.
Identifiers: Denitration.

The objectives were to define basic waste characteristics from recreation areas, evaluate existing treatment processes and to develop a guide for the planning and design of wastewater treatment facilities at recreation areas. The two winter recreation areas included Timberline Lodge on Mt. Hood, approximately 50 miles east of Portland, Oregon, and Crystal Mountain Ski Area near Mt. Rainier National Park, approximately 50 miles east of Tacoma, Washington. The two summer areas included Sunset Bay State Park, also on the Oregon coast, approximately five miles north of Bandon. The problems of designing these systems is discussed. Such factors as variations in pH ad flow present design difficulties. (Author)

PB-208 437
Pacific Northwest Water Lab., Corvallis, Oreg.
BASIC WASTE CHARACTERISTICS AT WINTER RECREATION AREAS.
Progress rept.,
B. David Clark. Jan 69, 88p PR-7 W72-07249, FWPCA-15010-01/69

Descriptors: (*Recreational facilities, *Sewage treatment), Design criteria, Skiing, Flow rate, Regression analysis, Washington (State), Oregon.

Findings are summarized of surveys at three winter sports areas to determine basic wastewater characteristics and recommend criteria for use in the design of treatment facilities. The tree sites selected were Crystal Mountain Ski Area near Mt. Rainier National Park, Washington, Timberline Lodge on Mt. Hood, Portland, Oregon, and Bachelor Butte Ski Area, Oregon. The quantity of various wastewater parameters discharged is a linear function of number of full-time employees, and either or both total visitors and overnight guests depending on the facilities. This relationship was vertfied by multiple linear regression analysis techniques. Statistically significant but highly variable relations were developed for COD, BOD5, suspended solids, total Kjeldahl nitrogen, and total phosphates. It is recommended that the maximum value of the 95 percent confidence limit be used in selecting design values. Methods for estimating design organic loading and design solids loading were developed. (Author)

PB-208 438
Pacific Northwest Water Lab., Corvallis, Oreg.
HOUSEBOAT WASTE CHARACTERISTICS AND TREATMENT,
B. D. Clark. Sep 67, 41p PR-6 W72-07250, FWPCA-15020-04/68

Descriptors: (*Sewage treatment, *Boats), Marinas, Sewage, Flow rate, Houses, Aeration, Aerobic processes, Oils, Greases.
Identifiers: *Houseboats, Shipboard sewage treatment systems, Water pollution control.

It was found that the average per capita BOD5, per capita suspended solids, grease, and oil in the houseboat waste is higher than normal domestic sewage and waste from the average land residence. Small extended aeration biological treatment units seem to offer a practical means of economically providing secondary treatment for houseboat wastes. The average daily flow, concentration, and treatment problems are discussed. (Author)

PB-208 439
Pacific Northwest Water Lab., Corvallis, Oreg.
HOUSEBOAT WASTES: METHODS FOR COLLECTION AND TREATMENT,
B. D. Clark. Jun 67, 84p W72-07251, FWPCA-15020-06/67

Descriptors: (*Sewage treatment, *Boats), (*Marinas, Sewage treatment), Docks, Sanitary engineering, Collecting methods, Cost estimates, Houses, Recreational facilities, Aerobic processes, Design, Sewers.
Identifiers: *Houseboats, Shipboard sewage treatment systems, Water pollution control.

The study area included the States of Washington, Oregon, and California which have over 1200 houseboats and many other floating structures requiring sewage collection and treatment facilities. Average daily houseboat wastewater quantities are similar to those for normal land residences with a daily per capita flow of 75 gpd. Pumping all wastes to a shore sewer is the least expensive and most practical alternative wherever this is possible. Individual treatment devices including macerator-chlorinator toilets, incinerator toilets, septic tanks with soil absorption fields, and aerobic extended aeration units were considered. Costs are presented. (Author)

PB-208 659
Environmental Protection Agency, Washington, D.C.
STATE AND MUNICIPAL NON-OCCUPATIONAL NOISE PROGRAMS.
Final rept.

31 Dec 71, 39p* EPA-NTID300.8

Descriptors: (*Noise reduction, *Government policies), Noise (Sound), Financing, Local government, State government, Research management.
Identifiers: *Noise pollution.

The document is a report on state and municipal government nonoccupational noise abatement and control programs prepared from information obtained in response to a questionnaire disseminated by the Environmental Protection Agency (EPA). They were forwarded by the EPA Administrator to the governors of each state (including Guam, Puerto Rico, the Virgin Islands) and the mayors of the 153 cities having populations, as of 1970, of 100,000 or more. The questionnaire requested information concerning the level and scope of existing and planned noise abatement and control programs. It furthermore solicited opinions on what additional support programs could be developed by the Federal government. (Author)

PB-208 660
Wyle Labs., Inc., El Segundo, Calif.
TRANSPORTATION NOISE AND NOISE FROM EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES.
Final rept.

31 Dec 71, 427p* EPA-NTID300.13
Contract DI-68-04-0046

Descriptors: (*Noise (Sound), *Pollution), (*Transportation, *Noise reduction), (*Internal combustion engines, Noise reduction), Rail transportation, Air transportation, Highway transportation, Aircraft noise, Jet aircraft noise, Engine noise, Automobiles, Water transportation, Engine mufflers, Automobile engines, Sonic boom, Short takeoff aircraft, Diesel engines, Trucks, Buses, Motorcycles, Snow vehicles, Hand tools, Communities, Acoustic measurement, Helicopters, Propeller noise, Rapid transit railways, Sources, Acoustic measurement.
Identifiers: *Noise pollution, Vehicular traffic noise, Snowmobiles, Recreation vehicles, Lawn mowers.

The report describes noise sources and their impacts. Transportation sources covered are: Commercial aircraft, V/STOL aircraft, general aviation aircraft, highway vehicles, rail systems, ships, and recreation vehicles. Devices powered by internal combustion engines include chain saws, lawnmowers, model aircraft, battery chargers, etc. (Author)

PB-208 674
Great Lakes Research Inst., Erie, Pa.
EVALUATION, EXTRACTION, AND RECYCLING OF CERTAIN SOLID WASTE COMPONENTS.
Final rept.,

1972, 126p* EPA-SW-35D-72
Grant PHS-EC-00292

Descriptors: (*Waste disposal, Materials recovery), (*Refuse disposal, *Materials recovery), (*Classifiers, *Waste treatment), Waste disposal, Waste papers, Metal scrap, Glass, Ceramics, Aluminum, Tires, Copper, Plastics, Earthfills, Cost estimates, Industrial engineering, Engineering drawings, Design criteria.
Identifiers: *Waste recycling, *Solid waste disposal.

The constituents of municipal solid waste are identified along with relative weight percentages typically found. Recycling priorities are established with respect to realistic criteria. Though the study was performed for Erie, Pennsylvania, concepts may be applied elsewhere. Paper, ferrous metals, aluminum, and rubber tires are listed, in that order, with respect to desirability of extraction. Tin cans, glass, and plastics are listed next under additional criteria. A survey of current technology is presented that briefly discusses unit processes as well as complete systems under development. Many unit processes are found to be an outgrowth from mining practices. A device called the 'Bowerman Classifier' is presented and incorporated into a system with potential to separate preprocessed municipal waste. The device operates on the priaciple of Stoke's Law applied to a moving fluid. All else being held equal, settling velocity will be proportional to density and thus a separation may be effected. (Author)

PB-208 813
Texas Tech Univ., Lubbock. Water Resources Center.
POTENTIAL POLLUTION OF THE OGALLALA BY RECHARGING PLAYA LAKE WATER. PESTICIDES,
Dan M. Wells, Ellis W. Huddleston, and Robert G. Rekers. Oct 70, 40p W72-07761, EPA-16060-DCO/10/70
Paper copy available from SOD $0.40 as EP2.10:16060 DCO 10/70.

Descriptors: (*Insecticides, Water pollution), (*Water pollution, *Surface water runoff), (*Aquifers, Water pollution), (*Texas, Aquifers), Ground water recharge, Water quality, Texas, Sources, Dieldrin, DDT, Aldrin, Herbicides, Water supply, Lakes, Gas chromatography, Water analysis.
Identifiers: Lubbock County (Texas), Playa lakes, Water pollution detection, *Ogallala formation.

Twenty-four playa lakes in Lubbock County, Texas, were sampled on a routine basis following runoff-producing rainfall for a period of approximately eighteen months to determine whether or not recharging of water collected in these lakes might be a hazard to the quality of water contained in the underlying Ogallala aquifer. In addition, fifteen lakes lying within a triangle bounded by Plainview, Canyon, and Hereford, Texas, were sampled during the summer of 1969 to provide additional data regarding the extent of the potential problem. The quality of water in High Plains playa lakes was found to be superior to the quality of water contained in the underlying aquifer in terms of the amount of dissolved materials. The compound most commonly found in sediment samples was Dieldrin, with Aldrin being next most common, and DDT found in only a few sediment samples. (Author)

PB-208 815
Metcalf and Eddy, Inc., Boston, Mass.
STORM WATER PROBLEMS AND CONTROL IN SANITARY SEWERS, OAKLAND AND

BERKELEY, CALIFORNIA.

Mar 71, 311p W72-07785, EPA-WQO-11024-EQG-03/71
Contract EPA-WQO-14-12-407
Paper copy available from GPO $4.00 as SN 5501-0095.

Descriptors: (*Storms, Surface water runoff), (*Sanitary sewers, *Fluid infiltration), Computerized simulation, Rainfall, Flood routing, Storm sewers, Drainage, Flood control, Cost estimates, Water pollution, Bays, California.
Identifiers: *San Francisco Bay.

An engineering investigation was conducted on storm water infiltration into sanitary sewers and associated problems in the East Bay Municipal Utility District, Special District No. 1, with assistance from the cities of Oakland and Berkeley, California. Rainfall and sewer flow data were obtained in selected study subareas that characterized the land use patterns predominant in the study area. Results obtained were extrapolated over larger drainage areas. A computerized flow routing program for the sewer system was used in this analysis. Ratios of infiltration to rainfall in the study subareas range from 0.01 to 0.14. Ratios of peak wet weather flow to average dry weather flow range from 2.1 to 9.1. (Author)

PB-208 817
West Virginia Univ., Morgantown. Div. of Plant Sciences.
MINE SPOIL POTENTIALS FOR WATER QUALITY AND CONTROLLED EROSION.

Dec 71, 211p W72-07796, EPA-14010-EJE-12/71
Paper copy available from GPO $1.75 as EP 2.10:14010 EJE 12/71.

Descriptors: (*Coal mines, Spoil), (*Spoil, *Water reclamation), Strip mining, Acidity, Iron, pH, Pyrite, Drainage, Ion exchanging, Particle size, Lysimeters, Water pollution, Erosion, Water quality, West Virginia.
Identifiers: Preston County (West Virginia).

Analysis of exploratory test cores and rock chip samples has made available information necessary to the development of rational techniques for reclaiming coal mine spoil for useful purposes. By assigning an area a particular future use and analyzing the rock structure in advance of the surface mining, materials can be assembled and placed in the fill to allow the filled strip mine to revegetate and be developed into a useful area. Oxidation of pyrite materials, source of most acidity below 4.0 in mine spoils, can be controlled by: (1) using clay shales for fill; (2) controlling gain size in the fill; and (3) controlling accessibility to exchange of solutes and oxygen. In miniature lysimeters filled with 4 ft of normal, loamy (pH 6.7) soil, no acidity nor iron drained from the bottom from pyrite buried at 6 depths, from 1/2 to 36 inches, during a 24 week test period. Base exchange by the soil neutralized the acid and retained the iron. (Author)

PB-208 818
JBF Scientific Corp., Burlington, Mass.
ENGINEERING METHODOLOGY FOR RIVER AND STREAM REAERATION.

Oct 71, 128p W72-07797, EPA-16080-FSN-10/71

Descriptors: (*Stream pollution, *Aeration), (*Water pollution, Aeration), Water quality, Reviews, Aerators, Oxygen, Dissolved gases, Biochemical oxygen demand, Diffusers, Diffusion, Cost estimates, Site surveys.
Identifiers: *Water pollution control.

Results of recent activities in river and stream aeration by artificial techniques are reviewed, and a rational engineering methodology is developed for future river and stream aeration projects. The development of the methodology follows from a thorough review of the oxygen dynamics in rivers and streams and the capabilities of aeration systems within the present state of the art. The report shows how the theoretical work can be simplified considerably and applied to the solution of river and stream water quality problems. It is assumed that aeration would only be used as a polishing action. The results indicate that artificial aeration can be applied successfully to raise dissolved oxygen to 5 ppm, using mechanical surface aerators, diffusers, downflow contactors, and sidestream mixing. (Author)

PB-208 819
Wyoming Univ., Laramie. Water Resources Research Inst.
WATER BUDGET FOR THE CITY OF LARAMIE, WYOMING.
Water pollution control research series,
Paul A. Rechard. Sep 71, 34p W72-07798, EPA-17050-DVO-09/71
Paper copy available from GPO $0.50 as EP2.10:7050DVO09/71.

Descriptors: (*Wyoming, Water supply), (*Water supply, *Water pollution), Urban areas, Rivers, Sanitary engineering, Lagoons (Ponds), Industrial water, Water conservation.
Identifiers: *Laramie (Wyoming), Laramie River, Aeration ponds.

The water budget for the city of Laramie, Wyoming, was calculated for the years 1966-1970 in order to supplement studies of the city's sewage lagoons and to estimate the effects of municipal use on the Laramie River. Usage during the summer months (April-September) varied directly with temperature and inversely with rainfall, with an average of 235 gpcd. The river furnished approximately 1/3 of the annual supply, and more than 1/2 of the summer supply. On an annual basis, however the city returned more water to the river than it withdrew. (Author)

PB-208 820
Tyco Labs., Waltham, Mass.
ELECTROCHEMICAL TREATMENT OF ACID MINE WATERS.
Water pollution control research series.

Feb 72, 89p W72-07799, EPA-14010-FNQ-02/72
Contract EPA-14-12-859
Paper copy available from GPO $1.00 as EP2.10:14010FNQ.

Descriptors: (*Water pollution, Mine waters), (*Mine waters, *Electrolysis), (*Iron inorganic compounds, *Oxidation), Fluidized bed processing, Electrolytic cells, Design, Cost estimates, Operating costs, Chemical reactors, Electrodes, Capital costs, Neutralizing, Limestone, Sludge disposal.
Identifiers: *Water pollution control, *Mine acid drainage, Packed bed reactors.

Synthetic acid mine drainage (AMD) water was prepared by draining tap water through waste coal, and the resulting AMD was treated on a laboratory scale by an electrolytic oxidation process. Tests of fluidized bed, packed-bed, and annular flow prototype reacotrs demonstrated the packed-bed reactor to be most efficient. Oxidation of Fe (2+) to Fe (3+) takes place on a carbon electrode at a mass transport limited rate, while hydrogen evolution occurs on a polished 316 stainless steel cathode, limited by a slower electrochemical kinetic step. Preliminary economic analyses, using a packed-bed reactor are given. The electrolytic process is free from both the safety hazards associated with radio isotope-induced oxidation and the temperature dependence of biological oxidation methods. (Author)

PB-208 821
Uniroyal, Inc., Wayne, N.J.
FEASIBILITY STUDY OF REGENERATIVE FIBERS FOR WATER POLLUTION CONTROL.
Water pollution control research series.

Oct 70, 80p W72-07800, EPA-17040-DFC-10/70
Contract EPA-14-12-815
Paper copy available from GPO $0.75 as EP2.10:17040DFC10/70.

Descriptors: (*Ion exchange resins, *Spinning (Extruding)), (*Synthetic fibers, Ion exchange resins), Sulfonic acids, Crosslinking, Polystyrene, Sulfonation, Polybutadiene, Polypropylene fibers, Regeneration (Engineering), Swelling, Epoxy resins, Cation exchanging, Anion exchanging, Feasibility, Amines, Quaternary ammonium salts, Industrial waste treatment.
Identifiers: *Melt spinning, Poly (Ethylene/sulfophenyl), Poly (Ethylene/pyridyl), Poly (Iminoethylene).

High molecular weight organic polymers co-spun with fiber-forming polymers and cross linking agents have been successfully spun into fiber and chemically treated to produce ion exchanging fibers, as opposed to the conventional beads. Styrene sulfonic acid cation exchange fibers having capacities up to 4.2 meq/gm dry fiber were prepared, using polypropylene and polybutadiene as fiber-forming polymer and cross linking agent respectively. Selectivities of fibers were similar to those of conventional beads, but different selectivities for the fibers may be possible due to anisotropic swelling of the fibers. Several other types of fibers were successfully fabricated. (Author)

PB-208 937
Southwest Research Inst., San Antonio, Tex.
AN INVESTIGATION OF DIESEL POWERED VEHICLE ODOR AND SMOKE. PART I.
Final rept.,
Karl J. Springer. Apr 67, 647p APTD-1089
Contract PH-86-66-93
Errata sheet inserted. See also Part 2, PB-207 850.

Descriptors: (*Diesel engines, *Exhaust gases), (*Smoke abatement, Diesel engines), (*Odors, Diesel engines), (*Air pollution, Exhaust gases), (*Air pollution control equipment, Diesel engines), Measurement, Odor detection, Smoke, Particles, Buses (Vehicles), Motor trucks, Field tests, Cyclic loads, Dynamometers, Simulation, Odor control, Smell, Dilution.
Identifiers: *Diesel exhaust.

Noticeable levels of diesel smoke and odor both from two-cycle powered city buses and four-cycle powered intercity trucks were investigated. Field studies, development of facilities and procedures, study of vehicle variability, and investigation of two techniques for smoke reduction were included. Results of field studies indicated that the two-cycle powered bus odor and smoke were grossly different from the four-cycle powered truck. Resonable atmospheric dilution levels from a typical horizontal bus exhaust were found. The odor measurement method involved simultaneous exposure of a panel of ten persons to a dynamically diluted sample of diesel exhaust. Utilizing various measurement methods, chassis dynamometer, panel, and smokemeter procedures were developed for the city bus and for the intercity tractor. (Author)

PB-208 944
Catalytic, Inc., Charlotte, N.C.
APPLICABILITY STUDY. COAL GASIFICATION PROCESS.
Final rept.,
L. K. Jain, and T. J. Hixson. Mar 72, 26p* APTD-1103
Contract EPA-68-02-0241

Descriptors: (*Coal gasification, Feasibility), (*Manufactured gas, Feasibility), Industrial engineering, Desulfurization, Air pollution, Design

criteria, Furnaces, Maintenance, Safety, Cost estimates, Capital costs.
Identifiers: *Air pollution abatement, *Low sulfur fuels.

The study objective was to determine the applicability of a commercial coal gasification process to electric utility and industrial boiler facilities for new installations and for the 'retrofit' of existing installations. Specific objectives were evaluation of the process with respect to cost, space limitations and operational, maintenance and safety aspects. In addition, a number of technical difficulties and unresolved problems are outlined. The use of the coal gasification process may offer potential capital cost savings, compared to existing methods of sulfur removal in the combustion of coal, markets for caking-type high sulfur coals (10,000 BTU/Lb. or less) and a method of reducing particulate emissions by converting coal to a cleaner fuel. (Author)

PB-208 950
Northern Research and Engineering Corp., Cambridge, Mass.
THE POTENTIAL IMPACT OF AIRCRAFT EMISSIONS UPON AIR QUALITY,
M. Platt, R. C. Baker, E. K. Bastress, K. M. Chng, and R. D. Siegel. 29 Dec 71, 330p* NREC-1167-1 APTD-1085
Contract DI-68-02-0085

Descriptors: (*Air pollution, Exhaust gases), (*Aircraft engines, *Exhaust gases), (*Airports, Air pollution), Forecasting, Air transportation, Jet engines, Takeoff, Aircraft landing, Carbon monoxide, Nitrogen oxides, Sulfur dioxide, Particles, Lead, Hydrocarbons, Evaporation, Air pollution control equipment, Atmospheric motion.
Identifiers: *Aircraft exhaust, Jet engine exhaust, Air quality data.

The specific objectives were: to select representative airports for which detailed studies would be made of emissions and impact to determine aircraft emission factors and activity levels for the selected airports, to develop future projections of emission rates and their impact at the selected airports, and to determine emission rates and impact of unburned fuel resulting from fuel venting and other practices directly associated with aircraft operating cycles. The survey gives data on hydrocarbons, carbon monoxide, nitrogen oxides, particulates, SO2, and lead, all were in significant concentrations. Large reductions in concentrations of carbon monoxide, total hydrocarbons, nitrogen oxides, and particulates due to emissions of turbine-engine air-craft may be achieved by various control methods. However if this is not done, predictions presented show major pollution increases. (Author)

PB-208 965
Wisconsin Univ., Madison.
THE CHEMICAL INVESTIGATION OF RECENT LAKE SEDIMENTS FROM WISCONSIN LAKES AND THEIR INTERPRETATION.
Doctoral thesis,
Gilbert Carl Bartleson. Mar 71, 292p W72-07952, EPA-16010-EHR-03/71
Paper copy available from GPO $2.25 as EP2.10:16010HR 03/71.

Descriptors: (*Lakes, Sediments), (*Sediments, Chemical analysis), (*Limnology, *Sedimentation), Stratigraphy, Cores, Sedimentary petrology, Wisconsin, Nutrients, Nitrogen inorganic compounds, Phosphorus inorganic compounds, Calcium inorganic compounds, Carbon, Pollen, Magnesium inorganic compounds, Potassium inorganic compounds, Aluminum inorganic compounds, Iron inorganic compounds, Manganese inorganic compounds, Theses.
Identifiers: Lake Mendota (Wisconsin), Madison lakes (Wisconsin), *Eutrophication.

To trace the effects of cultural eutrophication, one meter sediment cores were used to determine the history of calcareous and noncalcareous Wisconsin lakes. Cores were analyzed for carbon, phosphorus, calcium, magnesium, potassium, aluminum, iron, and manganese. Determinations of organic nitrogen, exchangeable ammonium and acid soluble phosphorus were made on selected sedimentary profiles. Recent sedimentation rates and identification of pre- and postcultural sediments were determined by ragweed pollen. Enrichment of phosphorus in postcultural Lake Mendota, Wisconsin, sediments are the effect of increased phosphorus supply from domestic sewage. Chemical stratigraphy of concentration-depth diagrams permit a qualitative evaluation of cultural activities. Potentialities and limitations of using recent lake sediments to evaluate eutrophication are discussed. (Author)

PB-208 968
Washington Univ., Seattle. Fisheries Research Inst.
RESPONSE OF TELEOST FISH TO ENVIRONMENTAL STRESS.
Water pollution control research series.

Feb 71, 130p W72-08058, EPA-WQO-18050-EBK-02/71
Paper copy available from GPO $1.25 as EP2.10: 18050 EBK 02/71.

Descriptors: (*Salmon, *Water pollution), (*Fishes, Water pollution), Aquatic biology, Ecology, Oxygen, Oxygen consumption, Physiology, Respiration, Swimming, Lipid metabolism, Hematology, Animal behavior, Animal migrations.
Identifiers: *Water pollution effects (Animals).

A floating laboratory was built for conducting multiparameter physiological studies on salmon in marine, estuarine, and fresh waters. New methods were developed using a swimming chamber-respirometer for adult salmon. Normal values were measured for a variety of physiological functions, then repeated on salmon migrating through an urban estuary charachterized by sewage pollution and low DO. Effects seen included decreased swimming stamina and respiratory efficiency, decreased oxygen consumption and increased lactate, decreased urine flow and ammonia excretion, especially in the presence of environmental ammonia. Longer term disruptions in hematology and lipid metabolism were seen. Most of the effects occurred at DO concentrations just below 5 mg/liter, except for synergistic effects between ammonia and low DO at somewhat higher concentrations. (Author)

PB-208 987
Little (Arthur D.), Inc., Cambridge, Mass.
WATER QUALITY CRITERIA DATA BOOK. VOLUME I. ORGANIC CHEMICAL POLLUTION OF FRESHWATER.
Water pollution control research series.

Dec 70, 399p W72-08157, EPA-WQO-18010-DPV-12/70
Contract FWPA-14-12-538
See also Volume 2, PB-208 988.
Paper copy available from GPO as EP.10:18010 DPV 12/70.

Descriptors: (*Toxicology, Water pollution), (*Water pollution, *Organic compounds), Tables (Data), Reviews, Concentration (Composition), Carcinogens, Sources, Industrial wastes, Halohydrocarbons, Hydrocarbons, Mutagens, Sulfur organic compounds, Insecticides, Herbicides, Chlorine organic compounds, Carboxylic acids, Sulfonates, Organic phosphates, Aromatic polycyclic hydrocarbons, Metal containing organic compounds, Phenols, Leathal dosage.
Identifiers: Water pollution effects (Animals), Water pollution effects (Plants).

The report discusses and lists results from a literature search on organic water pollutants which have been found in U.S. waters. After a brief discussion on interpreting the results, tables are presented listing specific chemicals and not only their concentration but also the following: Toxicity; Tissue concentration; Carcinogenicity; Mutagenicity and teratogenicity; Sources; and Threshold doses.

PB-208 988
Little (Arthur D.), Inc., Cambridge, Mass.
WATER QUALITY CRITERIA DATA BOOK. VOLUME II. INORGANIC CHEMICAL POLLUTION OF FRESHWATER.
Water pollution control research series.

Jul 71, 280p W72-18010-DPV-07/71, EPA-WQO-08158
Contract FWPA-14-12-538
See also Volume 1, PB-208 987.
Paper copy available from GPO $2.25 as EP2.10: 18010 DPV 07/71.

Descriptors: (*Water pollution, *Inorganic compounds), (*Toxicology, Water pollution), Tables (Data), Reviews, Concentration (Composition), Carcinogens, Mutagens, Lethal dosage, Sources, Industrial wastes, Metals, Transition metals, Halogens, Sulfur inorganic compounds, Phosphorus inorganic compounds, Nitrogen inorganic compounds.
Identifiers: Water pollution effects (Animals), Water pollution effects (Plants).

A survey of the literature dealing with inorganic chemical compounds was conducted to obtain and reference data relevant to the establishment of water quality criteria. More than 5,000 publications were reviewed. While nearly 300 inorganic species may exist in freshwater only 87 were identified in the literature. A wide distribution in concentrations in potable and polluted water was found. Data on acute toxicity, chronic toxicity, carcinogenicity, mutagenicity, and teratogenicity of inorganic chemicals have been tabulated. Because of the design of most of these toxicological determinations, it is difficult to extrapolate from this data to human health. Correlations have been made of minimum lethal oral dose versus maximum concentrations reported in freshwater, and of minimum chronic toxic dose versus maximum concentration reported in drinking water. Examples of inorganic species which approach a safety limit have been observed. (Author)

PB-208 989
Envirogenics Co., El Monte, Calif.
URBAN STORM RUNOFF AND COMBINED SEWER OVERFLOW POLLUTION.
Water pollution control research series.

Dec 71, 204p W72-08160, EPA-WQO-11024-FKM-12/71
Contract FWPCA-14-12-197
Paper copy available from GPO $1.75 as EP210: 11024 FKM 12/71.

Descriptors: (*Surface water runoff, *Water pollution), (*Urban areas, Surface water runoff), Storm sewers, Water quality, Mathematical models, Computer programming, Design criteria, Combined sewers, Cost estimates, California, Water storage, Diurnal variations, Sewage treatment.
Identifiers: *Storm water runoff, *Sacramento (California).

Necessary data are not available in most areas to determine or predict distributions of storm water runoff and combined sewage flows and pollutant concentrations. To alleviate this problem, a procedure was developed to permit rapid, economical, and accurate assessments of system performance based on 3 different and important water quality criteria. The first criterion establishes an absolute maximum pollutant concentration which cannot be exceeded. The second

criterion establishes an acceptable distribution of pollutant concentration by specifying the greatest frequency of occurrence for a particular concentration value. The third criterion establishes the maximum acceptable excession frequency for a particular pollutant frequency. A computer model was then used with a modified rational runoff method to perform preliminary design tasks and weigh alternatives to the designs. Then the least costly system developed for the Sacramento, California area as an example. (Author)

PB-208 993
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
LONG RANGE SULFUR SUPPLY AND DEMAND MODEL.
Final rept.,
M. H. Farmer, and R. R. Bertrand. Nov 71, 422p*
GRU.1GM.71 APTD-1069
Contract EPA-EHSD-71-13

Descriptors: (*Sulfur, *Demand (Economics)), (*Economic forecasting, Sulfur), (*Supply (Economics), Sulfur), Byproducts, Utilization, Mathematic models, Prices, International trade, Air pollution, Abatement, Computer programs, Trends, Sulfuric acid, Coal preparation, Coal gasification, Stockpiling.
Identifiers: Waste gas recovery, Air pollution economics.

Sulfur demand, supply and price are projected to the year 2020. The projections are for use in establishing R and D priorities for recovery of abatement sulfur in marketable and non-marketable forms. The projections are made via a computer model, and permit estimation of the value of abatement sulfur at various times during the forecast period and for various sources and/or quantities of sulfur recovered in useful forms. The model includes the simulation of different abatement schedules and also of additional demand such as might be created by a national stockpile of elemental sulfur. The factors affecting the relative value of sulfur in acid and elemental form are analyzed. The foreign situation is also considered because of its impact on domestic supply/demand/price relationships. The future supply of sulfur will depend increasingly on recovery from fossil fuels. (Author)

PB-209 000
Drexel Univ., Philadelphia, Pa.
POLLUTION OF SUBSURFACE WATER BY SANITARY LANDFILLS. VOLUME 1.
Interim rept. 1 Oct 67-29 Sep 69,
A. A. Fungaroli. 1971, 198p EPA-SW-12RG.-71
Grant EP-000162
Paper copy available from GPO $1.50 as EP1.17:12RG. See also Volume 3, PB-209 002.

Descriptors: (*Earthfills, Water pollution), (*Water pollution, *Subsurface drainage), (*Refuse disposal, Water pollution), Hydrology, Groundwater, Lysimeters, Leaching, pH, Metals, Nutrients, Mathematical models, Computer programs.
Identifiers: *Sanitary landfills, *Solid waste disposal, Water pollution detection.

The study was to provide quantitative information as to the behavior of sanitary landfills under natural and simulated environmental conditions in an environment common to southeastern Pennsylvania and a large portion of the region extending between Washington, D.C., and Boston, Massachusetts. A laboratory and a field sanitary landfill were developed to generate the data needed to attain these long-range objectives. The report describes the experimental facilities. Also reported are some results on patterns of leachate-pollutant generation and a moisture routing model. (Author)

PB-209 001
Drexel Univ., Philadelphia, Pa.
POLLUTION OF SUBSURFACE WATER BY SANITARY LANDFILLS. VOLUME 2.
Interim rept., 1 Oct 67-31 Dec 68,
A. A. Fungaroli. 1971, 221p EPA-SW-12RG.1-71
Grant EP-000162
See also Volume 3, PB-209 002.

Descriptors: (*Earthfills, Water pollution), (*Water pollution, *Subsurface drainage), (*Refuse disposal, Water pollution), Tables (Data), Hydrology, Ground water, Leaching, Lysimeters, pH, Metals, Gases.
Identifiers: *Sanitary landfills, *Solid waste disposal.

This study was to provide quantitative information as to the behavior of sanitary landfills under natural and simulated environmental conditions in an environment common to southeastern Pennsylvania and a large portion of the region extending between Washington, D.C., and Boston, Massachusetts. A laboratory and a field sanitary landfill were developed to generate the data needed to attain these long-range objectives. The report contains the experimental data collected from Oct. 1, 1967, to Dec. 31, 1968. (Author)

PB-209 002
Drexel Univ., Philadelphia, Pa.
POLLUTION OF SUBSURFACE WATER BY SANITARY LANDFILLS. VOLUME 3.
Interim rept. 1 Jan-29 Sep 69,
A. A. Fungaroli. 1971, 174p EPA-SW-12RG.2-71
Contract EP-000162
See also Volume 1, PB-209 000.

Descriptors: (*Earthfills, Water pollution), (*Water pollution, *Subsurface drainage), (*Refuse disposal, Water pollution), Tables (Data), Hydrology, Ground water, Leaching, Lysimeters, pH, Metals, Gases.
Identifiers: *Sanitary landfills, *Solid waste disposal.

The study was to provide quantitative information as to the behavior of sanitary landfills under natural and simulated environmental conditions in an environment common to southeastern Pennsylvania and a large portion of the region extending between Washington, D.C., and Boston, Massachusetts. A laboratory and a field sanitary landfill were developed to generate the data needed to attain these long-range objectives. The report contains the experimental data collected from Jan. 1, 1969, to Sept. 29, 1969. (Author)

PB-209 023
Cottrell Environmental Systems, Inc., Bound Brook, N.J.
PILOT SCALE INVESTIGATION OF A VENTURI-TYPE CONTRACTOR FOR REMOVAL OF SO2 BY THE LIMESTONE WET-SCRUBBING PROCESS.
Final rept.

Oct 71, 142p* APTD-1070
Contract EPA-EHSD-71-24

Descriptors: (*Air pollution control equipment, Sulfur dioxide), (*Scrubbers, Air pollution control equipment), (*Limestone, *Adsorbents), (*Sulfur dioxide, *Adsorption), (*Air pollution, Sulfur dioxide), Coal, Electric power plants, Calcium oxides, Sodium carbonates, Fly ash, Carbonates, Efficiency, Dolomite (Rock), Particle size, Pilot plants, Chemical engineering.
Identifiers: *Air pollution control, Venturi scrubbers, Limestone scrubbing.

Control of sulfur dioxide emission from a coal-fired power generating boiler using a cocurrent venturi-type scrubber in series with a wetted film packed tower was studied in a one-thousand cfm pilot system. Sulfur dioxide absorption characteristics were studied in detail with three types of alkali materials, calcium oxide, sodium carbonate and calcium carbonate. Sulfates lime/fly ash and dolomitic lime were also tested and their absorption properties were compared to the calcium oxide results. The primary objectives were the development of design data for predicting sulfur dioxide absorption in a venturi scrubber with limestone-injection wet scrubbing and a combination of a venturi scrubber and packed tower with direct lime/limestone wet scrubbing. A simplified method for expressing the SO2 absorption was developed with standard linear correlation techniques. Process parameters relevant to the type of absorption device were studied so that the SO2 absorption efficiency could be estimated for similar operating systems. (Author)

PB-209 213
North Carolina State Univ., Raleigh. Dept. of Biological and Agricultural Engineering.
ROLE OF ANIMAL WASTES IN AGRICULTURAL LAND RUNOFF.
Water pollution control research series.

Aug 71, 123p W72-08298, EPA-WQO-13020-DGX-08/71
Paper copy available from GPO $1.25 as EP2.10:13020DGX08/71.

Descriptors: (*Water pollution, *Agricultural wastes), (*Surface water runoff, Water pollution), Nutrients, Nitrates, Livestock, Beef cattle, Dairy cattle, Poultry, Swine, Lagoons (Ponds), Sampling, Mathematical models, Water analysis, Hydrology, Phosphates, Bacteria.
Identifiers: Feedlot wastes, Eutrophication, Manure, *Water pollution control, Solid waste disposal.

Twelve typical agricultural areas representing three types of animal waste management techniques--lagooning, direct discharge into streams, and land spreading including pasture and drylot units--were studied to determine the amounts of and factors governing stream pollution from swine, dairy, beef, and poultry production operations. More than 1500 stream and lagoon effluent samples were collected with an automatic sampler developed for the study. The samples were analyzed for bacteria, nutrients, and degradable organics. Hydrological and waste management data were also collected. Study results point to the superiority of land spreading for the disposal of animal wastes. (Author)

PB-209 214
Texas Tech Univ., Lubbock. Water Resources Center.
CHARACTERISTICS OF WASTES FROM SOUTHWESTERN CATTLE FEEDLOTS.
Water pollution control research series.

Jan 71, 91p W72-08299, EPA-WQO-13040-DEM-01/71
Paper copy available from GPO $1.00 as EP2.10:13040DEM01/71.

Descriptors: (*Beef cattle, Agricultural wastes), (*Surface water runoff, Water pollution), (*Water pollution, Agricultural wastes), (*Waste disposal, *Agricultural wastes), Utilization, Lagoons (Ponds), Fertilizers, Hydrology, Nutrients, Anaerobic processes.
Identifiers: *Feedlot wastes, Solid waste disposal, Manure, *Water pollution control.

Research was conducted on experimental feedlots in Lubbock, Texas, to determine the characteristics of wastes from Southwestern cattle feedlots. The feedlots were generally operated in a manner conforming to normal commercial practice in the area. They were provided with collection pits that allowed the quantity of runoff to be measured accurately. Samples of runoff were collected routinely both during rainstorms and from the collection pits. Manure samples were also collected routinely for analysis. The quantity of runoff per unit area of concrete-surfaced lots is substantially greater than the quantity per unit area of dirt-surfaced lots. Concentrations of pollutants in

concrete-lot runoff are substantially higher than corresponding concentrations in runoff from dirt-surfaced lots. Agronomic studies indicate that runoff can be used for irrigation of crops, but extreme caution is required in the application of runoff to crops to prevent damage to them. (Author)

PB-209 257
Hittman Associates, Inc., Columbia, Md.
STUDY OF THE FUTURE SUPPLY OF LOW SULFUR OIL FOR ELECTRICAL UTILITIES.

Feb 72, 76p* HIT-499 APTD-1078
Contract EPA-EHSD-71-43

Descriptors: (*Electric power generation, Air pollution), (*Fuel oil, *Economic forecasting), (*Residual oils, Economic forecasting), (*Fuels, Electric power generation), Bunker oils, Fuel consumption, Sulfur, Trends, Public utilities, International trade, Supply (Economics), Demand (Economics), Air pollution, Abatement, Desulfurization.
Identifiers: *Low sulfur fuels, Air pollution abatement, Imports.

The report examines the future supply and demand of low sulfur fuel oil. Of all the fuels, residual oil (resid, No. 6, or 'Bunker C') was the most difficult to study. The currently available predictions on the supply and demand for electricity and fuels were collected and studied. Construction plans of the utilities were obtained. Data on United States and foreign production of residual oil were gathered including the availability of low sulfur fuel. Total demand for residual fuel was predicted along with the demand for low sulfur fuels. The potential supply of low sulfur fuels was predicted. The effects that import regulations have on this supply was studied. The costs of direct desulfurization of resid were estimated along with the costs of oil transportation. The supply and demand quantities for residual oil were compared for the 1970-1980 time period and conclusions were drawn as to what steps must be taken to satisfy the 1980 demand for low sulfur fuels. (Author)

PB-209 258
TRW Systems, Redondo Beach, Calif.
THE ECONOMIC EFFECTIVENESS OF MANDATORY ENGINE MAINTENANCE FOR REDUCING VEHICLE EXHAUST EMISSIONS.
Interim rept.

Jan 72, 93p* APTD-1072
Contract CPA-22-69-087
Prepared in cooperation with Scott Research Labs., Inc., San Bernardino, Calif.

Descriptors: (*Automobiles, Inspection), (*Air pollution, Exhaust gases), (*Automobile engines, *Exhaust gases), Feasibility studies, Maintenance, Economic analysis, Cost estimates, Mathematical models, Gas sampling, Optimization, Carbon monoxide, Hydrocarbons, Statistical analysis, Nitrogen oxides.
Identifiers: *Motor vehicle inspection, *Automobile exhaust, Air pollution abatement.

An investigation was made of the feasibility of controlling exhaust emissions through a program of mandatory vehicle inspection and maintenance. Exhaust emission quantities, i.e., levels and reductions, were estimated based on a constant volume sampling (CVS) procedure. The most cost-effective inspection interval is approximately yearly regardless of the inspection/maintenance procedures applied. Inspection procedures performed in a state lane using the measurement of emission levels under load are generally more cost-effective than those performed in franchised garages using conventional diagnostic instruments, but produce smaller emission reductions. A statistical analysis of the emission reductions for the baseline and test fleets has revealed that the predicted differences in mean emission levels is significant at greater than the 90 percent level of confidence. Emission reductions are most sensitive to the inspection approach used to reject vehicles and to the extent of the imposed maintenance. (Author)

PB-209 259
Battelle Columbus Labs., Ohio.
A STUDY OF THE FATE OF SO2 IN FLUE GAS.
Final rept.,
R. W. Coutant, E. L. Merryman, R. E. Barrett, R. D. Giammar, and A. Levy. 31 Mar 72, 43p
APTD-1107
Contract CPA-70-121

Descriptors: (*Air pollution, Sulfur dioxide), (*Flue gases, *Sulfur dioxide), Chemical reactions, Reaction kinetics, Plumes, Coal, Fuel oil, Sulfur, Fly ash, Humidity, Plumes, Chimneys, Temperature, Simulation, Electric power plants, Particles.

The purpose was to simulate on a laboratory scale the time-temperature profile of a central-station power plant and the early plume. A multipurpose furnace fired either with pulverized coal or with residual oil; a simulated boiler/economizer section; an electrostatic precipitator for use with coal firing; a stack section, in which temperature distribution was controlled independently by electrical heating; and a dilution and expansion chamber to simulate the early stages of plume development were used. The objectives were: Identification of sections of the system wherein major depletion in SO2 could be observed; Determination of the effect of fuel type on SO2 depletion; Determination of the significance of the contribution of fly ash to the overall SO2 depletion; investigation of the rate of oxidation of SO2 in the early stages of plume development; and Assessment of the effects of relative humidity, temperature, and process variables on the rate of SO2 loss in the early plume. First-order rate constants for the decay of SO2 in the plume agreed with those found by other investigators. (Author)

PB-209 266
Hittman Associates, Inc., Columbia, Md.
ELECTRICAL POWER SUPPLY AND DEMAND FORECASTS FOR THE UNITED STATES THROUGH 2050.
Feb 72, 57p HIT-498 APTD-1079
Contract EPA-EHSD-71-43

Descriptors: (*Electric power generation, Forecasting), Electric power, Utilization, Trends, Electric power plants, Requirements, Fuels, Economic analysis, Air pollution.

The historical growth of the demand for electrical power, the trends in selection of power plant fuels by geographic distribution, projections of power demand growth into the twenty-first century, and the potential impacts on national air quality resulting from the various alternatives of fuel usage are explored. In particular, power plants scheduled for construction from mid-1971 onward are surveyed to provide a basis for estimating the impact of national emission standards for sulfur dioxide on the electrical generating industry. Total installed power capacity will increase from about 320,000 megawatts in 1970 to about 1,000,000 megawatts in 1990, about 1,500,000 in 2000, and 5,200,000 in 2050. Fossil fuels supply about 83 percent of utility power in 1970. Fossil fuel use will decrease to about 50 percent in 2000 and to about 11 percent in 2050, while nuclear power will increase from the present 3 percent to about 45 percent in 2000 and to about 88 percent in 2050. (Author)

PB-209 267
Walden Research Corp., Cambridge, Mass.
IMPROVED CHEMICAL METHODS FOR SAMPLING AND ANALYSIS OF GASEOUS POLLUTANTS FROM THE COMBUSTION OF FOSSIL FUELS. VOLUME I. SULFUR OXIDES.
Final rept.,
J. N. Driscoll, and A. W. Berger. Jun 71, 261p*
APTD-1106
Contract CPA-22-69-95
See also Volume 2, PB-209 268.

Descriptors: (*Air pollution, *Flue gases), (*Sulfur dioxide, *Gas analysis), (*Sulfur trioxide, Gas analysis), Reviews, Gas detectors, Combustion products, Gas sampling, Chemical equilibrium, Oxidation, Sulfates, Adsorption, Gas flow, Samplers, Volumetric analysis, Colorimetric analysis, Spectroscopic analysis, Recommendations, Accuracy, Barium, Inorganic peroxides, Scrubbers, Gas sampling.
Identifiers: *Air pollution detection, Benzoquinone/ (barium-salt)-dichloro-dihydroxy.

State-of-the-art manual methods are reviewed for sampling and analysis of sulfur oxides. The determination of sulfur dioxide (10-3000 ppm) and sulfur trioxide (5-300 ppm) is reviewed for stationary fossil fuel combustion sources and for control equipment which may be installed to reduce the emissions from such sources. (Author)

PB-209 268
Walden Research Corp., Cambridge, Mass.
IMPROVED CHEMICAL METHODS FOR SAMPLING AND ANALYSIS OF GASEOUS POLLUTANTS FROM THE COMBUSTION OF FOSSIL FUELS. VOLUME II. NITROGEN OXIDES.
Final rept.,
J. N. Driscoll, and A. W. Berger. Jun 71, 173p*
APTD-1108
Contract CPA-22-69-95
See also Volume 1, PB-209 267 and Volume 3, PB-209 269.

Descriptors: (*Air pollution, Nitrogen oxides), (*Nitrogen oxides, *Gas analysis), Nitrogen dioxide, Nitrogen oxide (NO), Reviews, Gas detectors, Gas sampling, Combustion products, Flue gases, Chemical equilibrium, Reaction kinetics, Inorganic nitrates, Chemical reactions, Electrochemistry, Colorimetric analysis, Spectroscopic analysis, Adsorption, Exhuast gases, Sulfur dioxide, Recommendations.
Identifiers: *Air pollution detection, Phenol disulfonic acid analysis, Saltzman analysis.

State-of-the-art manual methods are reviewed for the determination of oxides of nitrogen in stationary fossil fuel combustion sources for the concentration range 5-2000 ppm for nitric oxide (NO), nitrogen dioxide (NO2), and total oxides of nitrogen (NO + NO2 or NOx). (Author)

PB-209 269
Walden Research Corp., Cambridge, Mass.
IMPROVED CHEMICAL METHODS FOR SAMPLING AND ANALYSIS OF GASEOUS POLLUTANTS FROM THE COMBUSTION OF FOSSIL FUELS. VOLUME III. CARBON MONOXIDE.
Final rept.,
J. N. Driscoll, and A. W. Berger. Jul 71, 72p*
APTD-1109
Contract CPA-22-69-95
See also Volume 2, PB-209 268.

Descriptors: (*Air pollution, Carbon monoxide), (*Carbon monoxide, *Gas analysis), Reviews, Gas detectors, Gas sampling, Combustion products, Flue gases, Chemical equilibrium, Chemical reactions, Adsorption, Oxidation, Reduction (Chemistry), Catalysts, Iodine inorganic compounds, Solubility, Palladium inorganic compounds.
Identifiers: *Air pollution detection, Hopcalite catalysts, Benzoic acid/ (silver-salt)-sulfoamino.

State-of-the-art manual methods are examined for sampling and analysis of carbon monoxide in stationary fossil fuel combustion sources for the concentration range 10-1000 ppm. (Author)

PB-209 271
Envirogenics Co., El Monte, Calif.
SYSTEMS EVALUATION OF REFUSE AS A LOW SULFUR FUEL. VOLUME I.
Final rept.,

R. M. Roberts, R. E. Sommerlad, A. P. Konopka, S. T. Braunheim, and R. C. Hanson. Nov 71, 311p* F-1295-Vol-1 APTD-1111
Contract CPA-22-69-22
See also Volume 2, PB-209 272. Prepared in cooperation with Foster Wheeler Corp., Carteret, N.J.

Descriptors: (*Refuse, *Fuels), (*Refuse disposal, *Boilers), Design, Furnaces, Sulfur dioxide, Abatement, Air pollution, Cost estimates, Collecting methods, Combustion products, Particles, Comminution, Separation, Capital costs, Operating costs, Engineering drawings, Incinerators.
Identifiers: *Solid waste disposal, Air pollution abatement, Low sulfur fuels.

The fuel properties of refuse and the mechanics and combustion technology associated with the utilization of refuse as a fuel in generating utility grade steam were systematically assessed. By estimating the inventories and compositions of refuse that would likely occur, the extent of SO2-abatement that might be realized in using refuse as a partial coal substitute was projected through the year 2000. Ten different combined-fuel (coal + refuse) fired boiler configurations were conceived and then analyzed in terms of process variables (plant power capacity, fuel-ratio, etc.); performance/cost characteristics were also predicted. Similarly treated were five plans for modifying existing plants to refuse-burning systems. At least one of the systems within the first group was identified as being a more cost-effective approach to refuse disposal than is landfill. The cost model was developed to consider all the major elements involved in the erection and operation of the candidate refuse-burning systems. Two new-plant configurations were extracted and subjected to detailed engineering analysis. Cost estimates were iteratively computed for the resulting preliminary designs. (Author)

PB-209 272
Envirogenics Co., El Monte, Calif.
SYSTEMS EVALUATION OF REFUSE AS A LOW SULFUR FUEL. VOLUME II.
Final rept.,
R. M. Roberts, R. E. Sommerlad, A. P. Konopka, S. T. Braunheim, and R. C. Hanson. Nov 71, 301p
F-1295-Vol-2 APTD-1112
Contract CPA-22-69-22
See also Volume 1, PB-209 271. Prepared in cooperation with Foster Wheeler Corp., Carteret, N.J.

Descriptors: (*Refuse, *Fuels), (*Refuse disposal, *Boilers), Combustion, Fouling, Furnaces, Design, Reviews, Air pollution control equipment, Air pollution, Abatement, Sulfur dioxide, Cost estimates, Mathematical models, Bibliographies.
Identifiers: *Solid waste disposal, Air pollution abatement, Low sulfur fuels.

As part of a study on the use of refuse as a low sulfur fuel, the report presents topics concerning this usage: Wastage and fouling in refuse combustion; State of the art survey on economic and design characteristics of steam generators; Cost model of using refuse as a fuel; Bibliography of refuse combustion; and Glossary. (Author)

PB-209 277
General Electric Co., Schenectady, N.Y. Mechanical Engineering Lab.
MODELING, ANALYSIS, AND EVALUATION OF RANKINE CYCLE PROPULSION SYSTEMS. VOLUME I. FINAL REPORT,
J. H. Skinner, R. P. Shah, and W. A. Boothe. Feb 72, 181p* S-71-1129-1 APTD-0960
Contract EPA-EHS-70-111
See also Volume 2, PB-209 278.

Descriptors: (*Automobile engines, *Rankine cycle), Digital simulation, Steam engines, Steam turbines, Combustion, Boilers, Heat transfer, Cyclic loads, Air pollution.

The objective was to develop a generalized computer model of a Rankine-cycle automotive propulsion system to be used for the analysis of propulsion system dynamics. Digital computer models were developed for the following propulsion system components: working fluid--water and organic; combustor; vapor generator; expander--reciprocating and turbine; condenser; regenerator; feedpump; and controls. Other vehicle system models which were developed to permit analysis of engine dynamics during realistic driving transients include: transmission; vehicle motion; route mission profiles; and driver. A module-linkage approach was employed. Linkage of the information signals forms a total system model which can be employed for transient analysis of the entire propulsion system. The derivation of the models and their application to specific designs are included. Steady-state and transient results are presented.

PB-209 278
General Electric Co., Schenectady, N.Y. Mechanical Engineering Lab.
MODELING, ANALYSIS, AND EVALUATION OF RANKINE CYCLE PROPULSION SYSTEMS. VOLUME II. USERS MANUAL,
J. H. Skinner, R. P. Shah, and J. B. Okesson. Feb 72, 426p* S-71-1129-2 APTD-0961
EPA-EHS-70-111
See also Volume 1, PB-209 277.

Descriptors: (*Automobile engines, *Rankine cycle), (*Computer programs, Manuals), Digital simulation, FORTRAN.

Computer program listings for the models derived and analyzed in Volume 1, PB-209 277, are presented. FORTRAN nomenclature, flow diagrams, input and output information, and other user instructions are also included. The manual has been prepared so that the user can link the programs together to form a component or system model, provide the needed input, run the program, and obtain and interpret the results. Each section deals with a particular model. All of the subroutines that are employed in constructing the model are listed. The total memory size requirements for all programs used in the total systems model is approximately 45K. The sections are: fluid property models; reciprocating expander model; turbine expander model; feedpump model; vapor generator model; condenser model; regenerator model; combustor model; transmission model; driver model; parametric design programs; and total system model. (Author)

PB-209 283
Hittman Associates, Inc., Columbia, Md.
SURVEY OF NUCLEAR POWER SUPPLY PROSPECTS.
Feb 72, 99p* HIT-501 APTD-1077
EPA-EHSD-71-43

Descriptors: (*Nuclear electric power generation, Forecasting), Reviews, Trends, Air pollution, Abatement, Converter reactors, Breeder reactors, Nuclear fusion, Cost estimates, Nuclear fuels, Reserves, Thermal power plants.
Identifiers: Air pollution abatement, Light water reactors.

A detailed review of the nuclear segment of the power industry and an evaluation of the ways in which nuclear power will impact on national air quality and emissions from fossil-fueled steam electric plants are presented. Electrical power from nuclear-fueled reactors will continue to grow at a substantial rate and will ultimately supply a major portion of electrical power in the United States. The development and use of nuclear plants will directly affect the use of fossil fuels to supply electrical power and will also directly affect the amounts of combustion products released to the environment. The forecast of future power supplied by nuclear reactors has been shown by optimization analysis to be strongly dependent upon the reactor types and their technological development. Fossil-fueled generating plants will continue to produce power at levels equal to or greater than 1970 levels for the next 80 years. (Author)

PB-209 285
Hittman Associates, Inc., Columbia, Md.
STUDY OF THE FUTURE SUPPLY OF NATURAL GAS FOR ELECTRICAL UTILITIES.

Feb 72, 44p* HIT-500 APTD-1080
EPA-EHSD-71-43

Descriptors: (*Natural gas, Forecasting), (*Fuels, Forecasting), (*Fuel consumption, Natural gas), Utilization, Supply (Economics), Demand (Economics), Liquefied natural gas, Substitutes, International trade, Coal gasification, Oil shale, Manufactured gas, Petroleum, Gas production, Gas reservoirs, Electric power generation, Cost estimates, Reserves, Air pollution, Abatement, Trends.
Identifiers: *Low sulfur fuels, Imports.

The availability of natural gas as a low sulfur fuel for electrical production was examined in light of historical usage and availability. The goal was to ascertain not only near term but extended demands. Projections were made out through the year 2000. Such alternates as coal and oil shale gasification, Liquid Natural Gas (LNG), and well stimulation were evaluated. It represents a very clean fuel and, as a result, a fuel which can become an important control in the fight against pollution. (Author)

PB-209 286
Mitre Corp., Bailey's Crossroads, Va.
ADVANCED AUTOMOTIVE POWER SYSTEM STRUCTURED VALUE ANALYSIS MODEL,
J. Dukowicz, W. Fraize, E. Keitz, S. Poh, and J. Stone. Oct 71, 284p* MTR-6085 APTD-0966
Contract F19628-71-C-0002

Descriptors: (*Automobile engines, Evaluation), (*Air pollution, Exhaust gases), (*Exhaust gases, Automobile engines), Mathematical models, Computer programs, Assessments, Design criteria, Cost estimates, Acceptability, Performance evaluation, Economic analysis, Safety, Maintenance, carbon dioxide, Hydrocarbons, Nitrogen oxides, Air pollution control equipment.
Identifiers: Computer aided analysis.

A model which will provide a tool in evaluating advanced low-emission automotive power systems, and a basis for decisions relating to further development of candidate power systems is presented. The technique is quantitative and readily adaptable to the stage of a candidate's development. It relies primarily on engineering measurements and provides consistent repeatable results. It allows the use of expert value judgments as a valid part of the evaluation process. The parameters which, when measured, will provide the information needed to describe and adequately evaluate the candidate are listed, and the measurement scales and the rationale for the parameter selection are provided.. The cost and economic factors critical to the evaluation of candidates are discussed. The analytical formulation of the model is addressed. Also included are value sets of parameters for eight evaluation categories: emissions, operating performance, acceptability, operating environment, safety, personnel and facilities, propulsion system technology and reliability and maintenance. (Author)

PB-209 291
Commins (J. A.) and Associates, Inc., Fort Washington, Pa.
A LOCALIZED STUDY OF GRAY IRON FOUNDRIES TO DETERMINE BUSINESS AND TECHNICAL COMMONALITIES CONDUCTIVE TO REDUCING ABATEMENT COSTS.

Jan 72, 191p* APTD-1081
Contract EPA-68-04-0043

Descriptors: (*Iron and steel industry, *Air pollution control equipment), (*Air pollution, *Industrial wastes), Foundries, Interest groups, Regulations, Cost estimates, Capital costs, Operating costs, Process variables, Financing, Taxes, Reverberatory furnaces, Scrubbers, Government policies, Particles, Furnance cupolas, Gas filters, Design criteria.
Identifiers: *Air pollution control, *Air pollution economics.

The thesis was that economies of scale both in purchase and in financing costs might be available to the grey iron foundries for air pollution control equipment, thereby lessening the financial impact in complying with air pollution regulations. This group buying-financing management technique was not known to have been applied to procurement and financing of air pollution abatement devices in any industry. The salient attributes of such an organization were surveyed. The various regulations in the geographical area of concern were examined to establish a tentative grouping of foundries by degree of control needed. Foundry operating procedures and cupola design factors that could affect cupola emissions were evaluated. Performance-cost tradeoff factors were studied, including a possible process change. Quotations were obtained for reverberatory furnace process replacement, and for a venturi scrubber as a function of quantity. Various financing alternatives were explored.

PB-209 371
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
LARGE POWER PLANT EFFLUENT STUDY (LAPPES). VOLUME III. INSTRUMENTATION, PROCEDURES, AND DATA TABULATIONS (1970),
Francis A. Schiermeier. Jan 72, 305p APTD-0735
See also Volume 2, PB-202 220.

Descriptors: (*Air pollution, *Combustion products), (*Electric power plants, Air pollution), Plumes, Sulfur dioxide, Tables (Data), Meteorological data, Topography, Climatology, Monitors, Thermal power plants, Meteorological instruments, Pennsylvania.
Identifiers: *LAPPES (Large Power Plant Effluent Study), Indiana County (Pennsylvania).

The Large Power Plant Effluent Study (LAPPES) was initiated during 1967 in Western Pennsylvania to evaluate the extent and effects of air pollution resulting from the largest complex of coal-burning generating stations in the United States. Two series of LAPPES field experiments were conducted in an area surrounding Homer City and Conemaugh Generating Stations; these experiments consisted of ground-based and airborne plume measurements supported by extensive meteorological observations. The report describes the topography and climatology of the generating station complex, the sulfur dioxide and meteorological monitoring equipment, and experimental procedures. Also presented are tabulations of plant operational parameters and the air quality and meteorological data collected. (Author)

PB-209 476
Battelle Columbus Labs., Ohio.
A STUDY OF THE INFLUENCE OF FUEL ATOMIZATION VAPORIZATION, AND MIXING PROCESSES ON POLLUTANT EMISSIONS FROM MOTOR-VEHICLE POWERPLANTS.
Rept. on Phase 2,
D. A. Trayser, J. A. Gieseke, R. D. Fischer, and F. A. Creswick. 31 Jan 72, 134p* APTD-0964
Contract EPA-CPA-70-20
See also report dated 30 Apr 69, PB-185 886.

Descriptors: (*Automobile engines, *Carburetion), (*Air pollution control equipment, Automobile engines), (*Carburetion, *Vaporizing), Spark ignition engines, Design, Atomizing, Fuel injectors, Intake systems, Impingement, Manifolds, Drops (Liquids), Evaporation, Flow rate, Samplers, Exhaust gases.
Identifiers: Air pollution control.

The objectives of the experimental program were to obtain experimental data on droplet impaction characteristics, fuel-film flow on manifold walls, and fuel vaporization for a better understanding of induction-system phenomena; and to demonstrate the potential of improved fuel atomization, fuel vaporization, and intake manifold design for improving air-fuel mixing and distribution. Ultrafine atomization, minimum manifold-passage turning angle, long passage bend radii, and low air velocity can reduce droplet impaction in an induction system. However, appreciable droplet impaction still occurs, even with droplet sizes as low as 14 microns, because of deposition by flow-induced air turbulence. Consequently, fuel vaporization by intake air preheating and by manifold surface heating is recommended in addition to improved atomization to reduce further the fuel film on the wall. An improved induction-system design concept is described. (Author)

PB-209 477
Battelle Columbus Labs., Ohio.
DEVELOPMENT OF A RAPID SURVEY METHOD OF SAMPLING AND ANALYSIS FOR ASBESTOS IN AMBIENT AIR.
Final rept. Jun 69-Jul 71,
W. M. Henry, R. E. Heffelfinger, C. W. Melton, and D. L. Kiefer. 29 Feb 72, 43p* APTD-0965
Contract CPA-22-69-110

Descriptors: (*Asbestos, *Gas sampling), (*Air pollution, Asbestos), Particles, Electron microscopy, Urban areas, Rural areas, Ash content, Impactors, Separation, Air filters.
Identifiers: *Air pollution detection, Transmission electron microscopy.

A methodology has been developed for the determination of ashes to asbestos fiber and fibril content of particulate samples collected from the air. The report describes the effort on development of the analytical method and gives details of the method which includes sampling, beneficiation of asbestos fiber and fibril, and determination of total asbestos by a transmission electron microscopic technique. Included in the report are results of analyses of samples collected near a point source, in urban ambient air, and in a remote rural site. (Author)

PB-209 478
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XI. A SECOND COMPILATION OF TECHNICAL REPORTS ON THE BIOLOGICAL EFFECTS AND THE PUBLIC HEALTH ASPECTS OF ATMOSPHERIC POLLUTANTS,
M. Y. Nuttonson. Jan 72, 154p APTD-1067
See also Volume 10, PB-204 362 sold 21 (3 1/2 mo).

Descriptors: (*Air pollution, *Public health), (*USSR, Air pollution), (*Hydrogen fluoride, Air pollution), (*Sulfur dioxide, Air pollution), (*Fluorides, Air pollution), (*Acetic acid, Air pollution), (*Phthalic anhydride, Air pollution), (*Alcohols, Air pollution), (*Ammonia, Air pollution), Toxicology, Atmospheric composition, Concentration (Composition), Translations, Toxic tolerences, Performance (Human).
Identifiers: *Air pollution effects (Animals), Air pollution standards.

The contents include the following: Maximum permissible concentrations of noxious substances in the atmospheric air of populated areas; Basic problems of sanitary protection of atmospheric air; Combined effect of hydrogen fluoride and sulfur dioxide on the body of man and animals; New data for the validation of the mean daily maximum permissible concentration of hydrogen fluoride in air; Sanitary evaluation of fluorides readily soluble in biological media; Biological effect of poorly soluble fluorides; Material for standardization of the maximum permissible concentration of hydrogen fluoride in populated areas; Reflex effect on the human organism of low concentrations of acetic acid and acetic anhydride; Threshold concentrations of paraffins in inhalation; Biological effect and hygienic evaluation of pollution of atmospheric air with phthalic anhydride; Data for a sanitary assessment of methanol in atmospheric air; Data for the validation of the maximum permissible concentration of ammonia; Pollution with vapors of hydrolytic ethyl alcohol and its effect on the organism. (Author)

PB-209 479
TRW Systems Group, Redondo Beach, Calif.
LASER HOLOGRAPHY STUDY OF OIL-FIRED BURNER COMBUSTION,
A. B. Witte, and B. J. Matthews. Nov 71, 61p*
14103-6004-RO-00 APTD-1088
Contract EPA-CPA-70-4

Descriptors: (*Oil burners, Flames), (*Flames, *Holography), Air pollution, Turbulence, Feasibility, Interferometers, Temperature measurement, Combustion products, Nitrogen oxide (NO), Data reduction.
Identifiers: *Interferometric holography.

The research objective was to design instrumentation and evaluate its feasibility for characterizing flame turbulence and temperature gradient for several burner configurations. In this way, it may be possible to relate basic flame characteristics to the generation of emissions, particularly NO which is formed and fixed in the primary combustion zone. The feasibility of recording fog-free holographic interferagrams of residential fuel fired oil burner flames was demonstrated with two holocameras designed to observe the near and far field of the burner. The most important feature observed interferometrically was that the flame structure is extremely turbulent. This turbulence made it impossible to resolve the fringe pattern on the centerline of the burner. Barewire thermocouple measurements made of the flame were corrected for radiation. Excellent quality holographic interferograms were recorded of a small burner (Bernzomatic burner). Recording a holographic interferogram of a hot air gun showed the feasibility of controlling the turbulence level of a flame-like hot gas. Preliminary data were also reduced in this case. (Author)

PB-209 480
Aerospace Corp., El Segundo, Calif. Office of Corporate Planning.
TECHNICAL AND ECONOMIC FACTORS ASSOCIATED WITH FLY ASH UTILIZATION.
Final rept.

26 Jul 71, 271p* TOR-0059 (6781)-1 APTD-1068
Contract F04701-70-C-0059

Descriptors: (*Fly ash, Utilization), (*Waste disposal, Fly ash), Aggregates, Fillers, Reviews, Soil aggregates, Bricks, Concrete durability, Limestone, Bituminous concretes, Lightweight aggregates, Portland cements, Concretes, Marketing, Cellular concretes.
Identifiers: *Solid waste disposal.

The objectives were to investigate the current and potential uses of regular fly ash and to: Identify the factors which inhibit its use, Investigate the applicability of substituting wet-limestone-modified fly ash in the regular fly ash market, and Make recommendations for developing both the regular and wet-limestone-modified fly ash markets. The results are presented. The study was directed toward fly ash produced by the coal burning power utilities. This constitutes the major portion of fly ash produced in this country and is the source of ash collected and sometimes used as a raw material for various products or applications. Presently, of the 26.5 million tons produced annually, approximately 1.6 to 2 million tons are utilized. (Author)

PB-209 559
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
COMPILATION OF AIR POLLUTANT EMISSION FACTORS, (REVISED).

Feb 72, 164p* AP-42
Supersedes PB-190 245. Paper copy also available from SOD as EP4.9:42.

Descriptors: (*Air pollution, *Industrial wastes), (*Transportation, Air pollution), (*Chemical industry, Air pollution), (*Food processing, Air pollution), (*Metal industry, Air pollution), (*Petroleum industry, Air pollution), (*Paper industry, Air pollution), (*Waste disposal, Air pollution), Combustion rate, Concentration (Composition), Exhaust gases, Combustion products, Coal, Fuel oil, Incinerators, Dry cleaning, Gasoline, Organic solvents, Cements, Ceramic materials, Evaporation, Sources.
Identifiers: *Solid waste disposal, *Cement industry.

Emission data obtained from source tests, material balance studies, engineering estimates, etc., have been compiled for use by individuals and groups responsible for conducting air pollution emission inventories. Emission factors given in this document, the result of the expansion and continuation of earlier work, cover most of the common emission categories: fuel combustion by stationary and mobile sources; combustion of solid wastes; evaporation of fuels, solvents, and other volatile substances; various industrial processes; and miscellaneous sources. When no source-test data are available, these factors can be used to estimate the quantities of primary pollutants (particulates, CO, SO2, NOx, and hydrocarbons) being released from a source or source group. (Author)

PB-209 641
San Diego Water Utilities Dept., Calif.
SEWAGE ODOR CONTROL BY LIQUID-GAS EXTRACTION.
Water pollution control research series.

Jul 70, 129p W72-08825, FWQA-16050-DEX-07/70
Grant WPD-135-01-67

Descriptors: (*Odor control, *Sewage treatment), (*Contactors, Odor control), (*Hydrogen sulfide, *Absorption), Adsorbents, Oxidizers, Sodium hydroxide, Calcium hypochlorites, Potassium permanganate, Copper sulfates, Absorbers (Equipment), Chlorine, Ammonium compounds, Cost estimates, Performance evaluation, Air pollution.
Identifiers: *Air pollution control.

An investigation into chemical methods for treatment of foul air was conducted by the City of San Diego. A pilot liquid-gas contactor was constructed of PVC lining and stainless steel shafting. Several oxidizing and absorptive chemicals (tap water, sodium hydroxide, calcium hypochlorite, potassium permanganate, copper sulfate, copper chelate, etc.) as well as biologically active materials, were used in the contractor to remove the foul odors in air vented from the sewage sedimentation tanks. Under the experimental sulfide levels of 1.0 to 20.0 ppm H2S (by weight in the gas) good removal was shown by commercial sodium hydroxide, gaseous chlorine and ammoniated copper chelate. Ozone, when used in conjunction with other reactive chemicals, helped in removal of odors other than H2S, as well as H2S. Approximate costs (chemicals only) for treating 1,000,000 cubic feet (28,318.5 cubic meters) of foul air are given. (Author)

PB-209 642
Argonne National Lab., Ill. Center for Environmental Studies.
THE RELATIONSHIP BETWEEN LAND USE AND ENVIRONMENTAL PROTECTION,
E. J. Croke, K. G. Croke, A. S. Kennedy, and L. J. Hoover. 31 Mar 72, 56p* APTD-1105
Presented at Joint Meeting of the President's Water Pollution Control Advisory Board and Air Quality Advisory Board, March 27-31, 1972.

Descriptors: (*Land use zoning, *Pollution), (*Air pollution, Land use zoning), (*Water pollution, Land use zoning), Land development, Environmental surveys, Abatement, Regulations, Law (Jurisprudence), Regional planning, Urban planning, State government, National government, Government policies, Trends, Waste disposal.
Identifiers: Air pollution abatement, Water pollution abatement, Solid waste disposal.

The case is outlined for integrating land-use planning and regulation with environmental protection. The document indicates some of the legal, institutional, organizational, and technical aspects of this approach to the preservation of environmental quality. There is a growing recognition of the need to subject public and private decisions regarding land use to a much closer scrutiny with regard to their environmental implications. An array of evaluative techniques now used either for land-use planning or for environamental planning may be of potential use in formulating environmental land use policies. If land use guidance and environmental protection objectives are to be integrated, programs for merging the procedures and practices of groups involved in these functions must be developed. (Author)

PB-209 647
TRW Systems Group, McLean, Va. Washington Operations.
ENGINEERING AND COST EFFECTIVENESS STUDY OF FLUORIDE EMISSIONS CONTROL. VOLUME II.
Final rept.,
J. M. Robinson, G. I. Gruber, W. D. Lusk, and M. J. Santy. Jan 72, 223p* SN-16893-000-Vol-2
APTD-0944
Contract EPA-EHSD-71-14
Prepared in cooperation with Resources Research, Inc., McLean, Va. See also Volume 1, PB-207 506.

Descriptors: (*Air pollution, *Fluorides), (*Air pollution control equipment, Fluorides), Economic analysis, Scrubbers, Spraying, Column packings, Cyclone separators, Separators, Settlers (Separators), Electrostatic precipitators, Air filters, Plant location, Bibliographies, Physical properties, Chemical properties, Solubility, Phosphate deposits, Iron and steel industry, Aluminum industry, Electric power plants, Glass industry, Smelters, Clays, Chemical industry.

An appendix is presented which contains a general discussion of fluoride emission control devices; an inventory of pertinent industrial plants and their location; tabulations of the physicochemical parameters of the evolved fluorides; and a bibliography. The appendix accompanies Volume I of the study (PB-207 506) which determines the engineering and cost effectiveness of control of soluble fluoride emissions from major industrial sources. (Author)

PB-209 662
Research Triangle Inst., Durham, N.C.
CHEMILUMINESCENT OZONE MEASUREMENT PROGRAM--OZONE TOTAL OXIDANT RELATIONSHIP IN AMBIENT AIR.
Final rept.,
Harold G. Richter, James R. Smith, and Lyman A. Ripperton. May 69, 84p APTD-1087
Contract PH-22-68-30
See also report dated Jan 71, PB-198 065.

Descriptors: (*Ozone, *Gas detectors), (*Air pollution, Ozone), Comparison, Chemiluminescence, Colorimetric analysis, Coulometers, Urban areas, Diurnal variations.
Identifiers: *Air pollution detection.

Ozone and total oxidant in ambient air were measured simultaneously for a two month period in Philadelphia and a similar period in Denver, Colorado. Ozone was measured by the chemiluminescent technique and total oxidant by both colorimetric and coulometric techniques. The object was to compare these methods. The ozone and total oxidant instruments were calibrated by a constant ozone source (standardized by the neutral KI analytical technique) at the beginning and end of each experimental period. The chemiluminescent instrument operated satisfactorily more than 97% of the time, but the colorimetric total oxidant instruments operated satisfactorily less than 50% of the time. It is thus not possible to calculate ozone concentrations in urban air from measured total oxidant concentrations with any degree of confidence. The chemiluminescent ozone measurement is more specific and less subject to interference than the colorimetric or coulometric 'total oxidant' measurement. (Author)

PB-209 672
National Air Pollution Control Administration, Washington, D.C.
METROPOLITAN TOLEDO INTERSTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Charles A. Kossack. Aug 70, 17p APTD-0994

Descriptors: (*Air pollution, *Ohio), (*Michigan, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Waste disposal, National government.
Identifiers: *Air quality data, *Toledo (Ohio), Monroe County (Michigan), Lucas County (Ohio), Wood County (Ohio), Federal facilities, Toledo Metropolitan Region.

The status is presented of the Federal facilities in the Metropolitan Toledo, Ohio Region with regard to implementation of the objectives prescribed by the Clean Air Act and Executive Order 11507. Quantitative data on fuel burning, refuse disposal practices and air pollutant emissions, are included. A summary by county of fuel-use by type --coal, fuel oil, natural gas-- is presented. (Author)

PB-209 673
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN DAYTON INTRASTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Wayne A. Blackard. Jan 71, 24p APTD-1001

Descriptors: (*Air pollution, *Ohio), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Waste disposal.
Identifiers: *Air quality data, Federal facilities, *Dayton (Ohio), Dayton Metropolitan Region, Clark County (Ohio), Darke County (Ohio), Greene County (Ohio), Miami County (Ohio), Montgomery County (Ohio), Preble County (Ohio).

The status is presented of the Federally owned facilities within the Metropolitan Dayton, Ohio Air Quality Control Region with regard to the implementation of the objectives prescribed by the Clean Air Act, as amended. Fuel usage, refuse disposal practices, air pollution emissions and proposed abatement measures for the listed installations are reported. (Author)

PB-209 674
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.

METROPOLITAN MINNEAPOLIS - ST. PAUL INTRASTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Wayne A. Blackard. Feb 71, 28p APTD-1005

Descriptors: (*Air pollution, *Minnesota), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Waste disposal.
Identifiers: *Air quality data, *Saint Paul (Minnesota), *Minneapolis (Minnesota), Federal facilities, Anoka County (Minnesota), Carver County (Minnesota), Dakota County (Minnesota), Hennepin County (Minnesota), Ramsey County (Minnesota), Scott County (Minnesota), Washington County (Minnesota).

The status is presented of the Federally owned facilities within the Metropolitan Minneapolis - St. Paul, Minnesota Air Quality Control Region with regard to the implementation of the objectives prescribed by the Clean Air Act, as amended. Fuel usage, refuse disposal practices, air pollution emissions and proposed abatement measures for the listed installations are reported. (Author)

PB-209 675
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
MILWAUKEE INTRASTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Carl Edlund. Dec 70, 23p APTD-1013

Descriptors: (*Air pollution, *Wisconsin), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Waste disposal.
Identifiers: *Air quality data, *Milwaukee (Wisconsin), Federal facilities, Kenosha County (Wisconsin), Milwaukee County (Wisconsin), Ozaukee County (Wisconsin), Racine County (Wisconsin), Walworth County (Wisconsin), Washington County (Wisconsin), Waukesha County (Wisconsin).

Federal installations are listed for the Milwaukee, Wisconsin region. The amount of fuel or refuse burned per year for each installation is included. The type and amount of fuels burned in each county by Federal facilities are also tabulated. The contribution by the Federal Government to the air pollution from fixed installations in this Region is presented in a series of tables. (Author)

PB-209 676
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN CINCINNATI INTERSTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Wayne A. Blackard. Dec 70, 31p APTD-0983
Addendum inserted.

Descriptors: (*Air pollution, *Ohio), (*Indiana, Air pollution), (*Kentucky, Air pollution), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Waste disposal.
Identifiers: *Air quality data, *Cincinnati (Ohio), Federal facilities, Cincinnati Metropolitan Region, Dearborn County (Indiana), Ohio County (Indiana), Boone County (Kentucky), Campbell County (Kentucky), Kenton County (Kentucky), Butler County (Ohio), Clermont County (Ohio), Hamilton County (Ohio), Warren County (Ohio).

The status is presented of the Federal facilities within the Metropolitan Cincinnati, Ohio Air Quality Control Region with regard to the implementation of the objectives prescribed by the Clean Air Act, as amended. Fuel usage, and refuse disposal practices of the facilities owned by the Federal Government are reported. This Region was subsequently redesignated and its boundaries expanded, hence, the data do not reflect Federal facility emissions data for these newly added counties. (Author)

PB-209 677
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN BIRMINGHAM INTRASTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
William Dennison. Jan 71, 23p APTD-0993
Addendum inserted.

Descriptors: (*Air pollution, *Alabama), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Waste disposal.
Identifiers: *Air quality data, Federal facilities, *Birmingham (Alabama), Birmingham Metropolitan Region, Blount County (Alabama), Jefferson County (Alabama), Shelby County (Alabama), Tuscaloosa County (Alabama), Walker County (Alabama), Saint Clair County (Alabama).

The status is presented of the federally owned facilities within the Metropolitan Birmingham, Alabama Air Quality Control Region with regard to the implementation of the objectives prescribed by the Clean Air Act, as amended. Fuel usage, refuse disposal practices, air pollution emissions and proposed abatement measures for the listed installations are reported. This Region was subsequently redesignated and its boundaries expanded, hence, the data do not reflect Federal facility emissions data for the counties of: Bibb, Chilton, Fayette, Greene, Hale, Lamar, Pickens and Sumter in Alabama, which have been added to the region. (Author)

PB-209 701
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN STEUBENVILLE INTERSTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
William Dennison. Jan 71, 21p APTD-0995

Descriptors: (*Air pollution, *Ohio), (*West Virginia, Air pollution), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Fuels, Waste disposal.
Identifiers: *Air quality data, *Federal facilities, *Steubenville (Ohio), Belmont County (Ohio), Jefferson County (Ohio), Monroe County (Ohio), Columbia County (Ohio), Brooke County (West Virginia), Hancock County (West Virginia), Marshall County (West Virginia), Ohio County (West Virginia).

The status is presented of the Federally owned facilities within the Metropolitan Steubenville Air Quality Control Region (Ohio and West Virginia) with regard to the implementation of the objectives prescribed by the Clean Air Act, as amended. Fuel usage, refuse disposal practices and air pollution emissions for the listed installations are reported. (Author)

PB-209 702
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN SAN ANTONIO INTRASTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Franklin M. Orr, Jr. May 71, 25p APTD-0996

Descriptors: (*Air pollution, *Texas), Federal government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Fuels, Waste disposal.
Identifiers: *Air quality data, *San Antonio (Texas), Bexar County (Texas), Comal County (Texas), Guadalupe County (Texas), *Federal facilities.

The status is presented of the Federally owned facilities within the Metropolitan San Antonio, Texas Air Quality Control Region with regard to the implementation of the objectives prescribed by the Clean Air Act, as amended. Fuel usage, refuse disposal practices, air pollution emissions and proposed abatement measures for the listed installations are reported. This Region was subsequently redesignated and its boundaries expanded, hence, the data do not reflect Federal facility emissions data for the newer counties. (Author)

PB-209 703
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN DALLAS FT. WORTH INTRASTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Franklin M. Orr, Jr. May 71, 34p APTD-0997

Descriptors: (*Air pollution, *Texas), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Fuels, Waste disposal.
Identifiers: *Air quality data, *Fort Worth (Texas), *Dallas (Texas), *Federal facilities, Dallas County (Texas), Denton County (Texas), Ellis County (Texas), Johnson County (Texas), Kaufman County (Texas), Parker County (Texas), Rockwall County (Texas), Tarrant County (Texas), Wise County (Texas), Collin County (Texas).

The status is presented of the Federally owned facilities within the Metropolitan Dallas - Ft. Worth, Texas Air Quality Control Region with regard to the implementation of the objectives prescribed by the Clean Air Act, as amended. Fuel usage, refuse disposal practices, air pollution emissions and proposed abatement measures for the listed installations are reported. This Region was subsequently redesignated and its boundaries expanded, hence, the data do not reflect Federal facility emissions data for the newer counties. (Author)

PB-209 704
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN HOUSTON GALVESTON INTRASTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Franklin M. Orr, Jr. Jul 71, 29p APTD-0998

Descriptors: (*Air pollution, *Texas), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Fuels, Waste disposal.
Identifiers: *Air quality data, *Federal facilities, *Houston (Texas), *Galveston (Texas), Brazoria County (Texas), Chambers County (Texas), Fort Bend County (Texas), Galveston County (Texas), Harris County (Texas), Liberty County (Texas), Montgomery County (Texas), Waller County (Texas).

The status is presented of the Federally owned facilities within the Metropolitan Houston-Galveston, Texas Air Quality Control Region with re-

gard to the implementation of the objectives prescribed by the Clean Air Act, as amended. Fuel usage, refuse disposal practices, air pollution emissions and proposed abatement measures for the listed installations are reported. This Region was subsequently redesignated and its boundaries expanded, hence, the data do not reflect Federal facility emissions data for the newer counties. (Author)

PB-209 705
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN LOUISVILLE INTERSTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
William Dennison. Apr 71, 21p APTD-1002

Descriptors: (*Air pollution, *Kentucky), (*Indiana, Air pollution), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Fuels, Waste disposal.
Identifiers: *Air quality data, *Louisville (Kentucky), Jefferson County (Kentucky), Clark County (Indiana), Floyd County (Indiana), *Federal facilities.

The status is presented of the Federally owned facilities in the Louisville region (Kentucky and Indiana) with regard to implementation of the objectives prescribed by the Clean Air Act and Executive Order 11507. Quantitative data on fuel burning and refuse disposal practices, air pollutant emissions, and abatement plans are included. A summary by county of fuel-use is presented. Pollutant emissions are summarized by county. (Author)

PB-209 717
National Air Pollution Control Administration, Washington, D.C.
CHATTANOOGA INTERSTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Robert S. Russo. Jun 70, 16p APTD-0992
Addendum inserted.

Descriptors: (*Air pollution, *Tennessee), (*Georgia, Air pollution), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Waste disposal.
Identifiers: *Air quality data, Federal facilities, *Chattanooga (Tennessee), Chattanooga Metropolitan Region, Hamilton County (Tennessee), Dade County (Georgia), Walker County (Georgia), Catoosa County (Georgia).

The status is presented of the Federal facilities in the Chattanooga, Tennessee region regarding implementation of the objectives prescribed by the Clean Air Act and Executive Order 11507. A quantitative evaluation of emissions, data on fuel burning and refuse disposal, and abatement plans are included. A summary by county of the fuel use is given. Pollutant emissions are summarized by county. The Region was subsequently redesignated and its boundaries expanded, hence, the data do not reflect Federal facility emissions data for the newly added counties. (Author)

PB-209 719
National Air Pollution Control Administration, Washington, D.C.
METROPOLITAN PROVIDENCE INTERSTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Robert S. Russo. Jun 70, 29p APTD-1000
Addendum inserted.

Descriptors: (*Air pollution, *Rhode Island), (*Massachusetts, Air pollution), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Waste disposal.
Identifiers: *Air quality data, Federal facilities, *Providence (Rhode Island), Bristol County (Rhode Island), Kent County (Rhode Island), Newport County (Rhode Island), Washington County (Rhode Island), Bristol County (Massachusetts), Norfolk County (Massachusetts), Plymouth County (Massachusetts).

The status is presented for the Federal facilities in the Providence, Rhode Island region regarding implementation of the objectives prescribed by the Clean Air Act and Executive Order 11507. A quantitative evaluation of emissions, data on fuel burning and refuse disposal, and abatement plans are included. A summary by county of the fuel use is given. Pollutant emissions are summarized by county. This Region was subsequently redesignated and its boundaries expanded, hence, the data do not reflect Federal facility emissions data for the newly added townships. (Author)

PB-209 741
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN PHILADELPHIA INTERSTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Carl E. Edlund. Oct 70, 48p APTD-0988

Descriptors: (*Air pollution, *Pennsylvania), (*Delaware, Air pollution), (*New Jersey, Air pollution), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Carbon monoxide, Combustion products, Fuels, Waste disposal.
Identifiers: *Air quality data, *Philadelphia (Pennsylvania), New Castle County (Delaware), Burlington County (New Jersey), Camden County (New Jersey), *Federal facilities, Gloucester County (New Jersey), Mercer County (New Jersey), Salem County (New Jersey), Bucks County (Pennsylvania), Chester County (Pennsylvania), Delaware County (Pennsylvania), Montgomery County (Pennsylvania), Philadelphia County (Pennsylvania).

A listing of the Federal facilities in the metropolitan Philadelphia Interstate Air Quality Control Region (Pennsylvania, Delaware, and New Jersey) is presented. A break-down of type and amount of fuels used by each political division is also tabulated. The contribution of the Federal Government to the air pollution in this Region is presented in a series of tables. The status of the Federal installation in the Region with respect to the implementation of their abatement plans is also shown. (Author)

PB-209 827
TRW Systems Group, Redondo Beach, Calif.
VEHICLE EMISSIONS SURVEILLANCE STUDY.

20 Aug 71, 180p APTD-1076
Contract CPA-22-69-087
Prepared in cooperation with Scott Research Labs., Inc., San Bernardino, Calif.

Descriptors: (*Air pollution, Exhaust gases), (*Automobile engines, *Exhaust gases), Sampling, Field tests, Temperature control, Mathematical models, Simulation, Test facilities, Manuals, Confidence level, Hydrocarbons, Carbon monoxide, Cost estimates, Project planning.
Identifiers: *Automobile exhaust, Motor vehicle inspection.

The objective was to recommend optimal procedures for conducting an automobile exhaust emissions field surveillance program. The primary objective of this field surveillance program is to characterize vehicular emissions to the atmosphere for specific regions within the United States. Alternatively, the data may be used to evaluate regional differences in vehicular emissions such as might occur because of different vehicle maintenance policies. General surveillance program guidelines were developed but were not amenable to mathematical modeling because of complexity and/or lack of definitive data. Specific procedures and equipment configurations were optimized using the surveillance system model. (Author)

PB-209 837
AeroChem Research Labs., Inc., Princeton, N.J.
OPERATIONS HANDBOOK FOR THE AEROCHEM PROTOTYPE CONTINUOUS CHEMILUMINESCENCE NO MONITOR.
Final rept.,
Richard J. Ronco, and Arthur Fontijn. May 71, 45p* AeroChem-TP-258 APTD-1115
Contract CPA-70-79

Descriptors: (*Gas detectors, *Nitrogen oxide (NO)), (*Monitors, Nitrogen oxide (NO)), Chemiluminescence, Ozone, Air pollution, Laboratory equipment, Design, Instructions, Calibration, Handbooks.
Identifiers: *Air pollution detection.

A prototype ambient air NO monitor (based on the NO/03 chemiluminescent reaction) which was designed, fabricated, and delivered is discussed in detail. Design considerations are also discussed. (Author)

PB-209 857
Robert S. Kerr Water Research Center, Ada, Okla.
NATIONAL IRRIGATION RETURN FLOW RESEARCH AND DEVELOPMENT PROGRAM.
Water pollution control research series,
James P. Law, Jr. Dec 71, 30p W72-08980, EPA-13030-GJS-12/71
Paper copy available from GPO $0.30 as EP2.10:13030-GJS-12/71.

Descriptors: (*Hydrology, Irrigation), (*Irrigation, *Water pollution), Surface water runoff, Ground water recharge, Project planning, Government policies, Leaching, Agricultural wastes, Fertilizers, Nutrients, Rivers, Research.
Identifiers: *Water pollution control.

The status of the National Irrigation Return Flow Research and Development Program is presented. Current research projects and future program development are discussed. The report represents the position of the Environmental Protection Agency (EPA) with regard to the development of effective controls on the quality of irrigation return flows. Program goals and milestones are outlined. A number of potential control measures are discussed. Improvements in the water delivery system, on-the-farm water management, and the water removal system are considered with respect to improving the quality of irrigation return flows and decreasing the degradation of receiving waters. Research and investigations are needed to evaluate the effectiveness of potential control measures. Demonstrations and educational activities will be required to overcome institutional, political, and legal constraints to water management reform. (Author)

PB-209 858
Cornell Univ., Ithaca, N. Y. Dept. of Agronomy.
MANAGEMENT OF NUTRIENTS ON AGRICULTURAL LAND FOR IMPROVED WATER QUALITY.
Water pollution control research series.

Aug 71, 154p W72-08981, EPA-13020-DPB-08/71
Paper copy available from GPO $1.25 as EP2.10:13020 DPB 08/71.

Descriptors: (*Nutrients, Water pollution), (*Surface water runoff, Nutrients), (*Fertilizing, Surface water runoff), Surface water, Phosphorus, Nitrogen, Farm crops, Simulation, Water erosion, Computer programs, Hydrology.
Identifiers: Manure, Water pollution control, Crop rotation.

A rainfall simulator was utilized to determine the effects of 2-, 10-, and 20-year storm frequencies on losses of water, soil and nutrients from plots subjected to different crop rotations, fertilizer schemes and manure applications. Crop rotations, rates of fertilizer and manure were compared. Simulations were made on freshly tilled soil. Comparative erosion losses were as follows: continuous sod - corn - alfalfa rotations continuous corn. Fertilizer alone tended to increase runoff, but this effect was overcome when fertilizer was used with manure. Continuous recording of surface and subsurface flow and subsequent losses of nutrients to the environment was conducted on larger plots. Rate and time of fertilization determined the plant nutrients lost. Returning crop residues to the soil improved water infiltration, increasing deep seepage losses. Phosphorous inputs into cultural media as it related to algal growth was studied. Sustained concentration determined the biomass of phosphorous. (Author)

PB-209 859
Eastern Municipal Water District, Hemet, Calif.
STUDY OF REUTILIZATION OF WASTEWATER RECYCLED THROUGH GROUND WATER. VOLUME I.
Water pollution control research series,
Doyle F. Boen, James H. Bunts, Jr., and Robert J. Currie. Jul 71, 190p W72-08982, EPA-16060-DDZ-07/71
Paper copy available from GPO $1.50 as EP2.10:16060-DDZ-07/71.

Descriptors: (*Sewage treatment, *Water reclamation), (*Ground water rechange, *Irrigation), Hydrogeology, California, Percolation, Geology, Hydrography, Water quality, Water analysis, Water pollution.
Identifiers: Sewage treatment effluent, *Sewage irrigation, Waste water reuse, San Jacinto River Basin.

A project to demonstrate the feasibility and safety of recycling water under operating conditions was performed in the Hemet-San Jacinto Valley of the State of California. It was felt that recycling of the water would ultimately lead to a reduction in the salt input and resultant degradation of the existing underground reservoir. Extensive geological investigations indicated that the basin was not homogeneous in nature but had clay lenses and faulting which interfered with the creation of a classic mound. Partially as a consequence, the recharge of 5,380 acre feet of wastewater during this six and one-half year period had no effect on surrounding water wells. The project added considerable knowledge and experience to the technology of intermittent wastewater percolation and associated monitoring techniques. A novel feature of the project was the employment of highly sensitive temperature probes to trace the lateral migration of the recharged water. (Author)

PB-209 860
American Water Works Association Research Foundation, New York.
INFORMATION RESOURCE: WATER POLLUTION CONTROL IN THE WATER UTILITY INDUSTRY.
Water pollution control research series,
H. A. Faber, and A. D. Nardozzi. Nov 71, 170p W72-08983, EPA-12120-EUR-11/71
Paper copy available from GPO $1.50 as EP2.10:12120 EUR 11/71.

Descriptors: (*Water treatment, *Waste disposal), (*Information retrieval, Water treatment), (*Water services, Waste disposal), Sludge disposal, Public utilities, Regulations, Coagulants, Coagulation, Sludge drying, Reviews, Aluminum sulfates, Materials recovery, Polymers, Centrifuging, Freezing, Lagoons (Ponds), Settling, Vacuum filtration, Project planning, Research, Government policies, Surveys.
Identifiers: Solid waste disposal, Liquid waste disposal, Technology transfer, Water pollution control.

The accomplishments are described of a program conducted to organize, coordinate, and disseminate information on new or modified sludge treatment technology for water treatment plant wastes. The reliable control of these potential pollutants is of increasing importance with the enactment and enforcement of more stringent pollution control legislation. The report contains information on research, engineering, plant operation, and regulatory aspects of the problem. A Project Advisory Committee provided recommendations for development of information resources, and assisted the Research Foundation in structuring an information clearinghouse. The report describes current research activities and new approaches for characterizing and reducing water treatment plant waste volumes. A program was initiated to evaluate the applicability of polymers as primary coagulants, coagulant aids, and sludge conditioning agents. (Author)

PB-209 861
Seattle Metropolitan Municipality, Wash.
MAXIMIZING STORAGE IN COMBINED SEWER SYSTEMS.

Dec 71, 227p W72-08984, EPA-WQO-11022-ELK-12/71
Contract EPA-13-WASH-1
Paper copy available from GPO $1.75 as EP2.10:11022-ELK-12/71.

Descriptors: (*Combined sewers, *Urban planning), (*Storage, Combined sewers), Management, Waste disposal, Flow control, Computer programming, Feasibility, Electronic control, Washington (State), Water pollution.
Identifiers: Seattle (Washington).

A major portion of the Seattle metro area comprehensive sewage collection and treatment plan launched in 1958, included improvements to an existing combined sewer system within Seattle's city limits. Initial plans included interception and treatment of raw sewage flowing to saltwater points, regulation of combined flows to utilize all available trunk storage, and construction of temporary storage tanks at freshwater overflow points. Construction has been completed to demonstrate the feasibility of applying computer-control concepts to make maximum use of all available storage within a collection system.

PB-209 862
Maryland Univ., Baltimore. School of Law.
LEGAL PROBLEMS OF COAL MINE RECLAMATION. A STUDY IN MARYLAND, OHIO, PENNSYLVANIA AND WEST VIRGINIA.
Water pollution control research series,
Everett F. Goldberg, and Garrett Power. Mar 72, 245p W72-08985, EPA-14010-FZU-03/72
Paper copy available from GPO $2.00 as EP2.10:14010FZU03/72.

Descriptors: (*Coal mining, *Pollution), (*Law (Jurisprudence), Coal mining), (*Land reclamation, Coal mining), Cost estimates, Regulations, Industrial waste, Water reclamation, Mine waters, Strip mining, Underground mining, Government policies, State government, Licenses, Legislation, Maryland, Ohio, Pennsylvania, West Virginia, Water pollution, Erosion, Spoil.
Identifiers: *Mine acid drainage, Solid waste disposal.

Coal mining produces a variety of environmental problems – acid drainage, sedimentation, surface subsidence and surface scars. The study reviews the response of legal institutions to those problems in Maryland, Ohio, Pennsylvania and West Virginia. Technological and economic concerns are also taken into account. The study discusses the antecedents of today's Appalachian coal industry and the environmental problems it has created. It examines the way in which the property system allocates rights in coal and coal lands, the efficacy of litigation and present laws and regulations for preventing environmental damage, and constitutional limitations on the ability of states to effectively respond to the problems. A case study of the economics of the Maryland coal industry is also presented. Model legislation giving the states the necessary powers to respond to environmental problems, is proposed. (Author)

PB-209 863
Florida Univ., Gainsville. Dept. of Environmental Engineering.
EUTROPHICATION FACTORS IN NORTH CENTRAL FLORIDA LAKES.
Water pollution control research series,
H. D. Putnam, P. L. Brezonik, and E. E. Shannon. Feb 72, 148p W72-08986, EPA-16010-DON-02/72
Paper copy available from GPO $1.25 as EP2.10:16010-DON-02/72.

Descriptors: (*Limnology, *Nutrients), (*Florida, Limnology), (*Lakes, Limnology), Ecology, Primary biological productivity, Fishes, Plankton, Land use, Demography, Phosphorus, Nitrogen, Phosphates, Nitrates, Ammonia, Fresh water biology.
Identifiers: *Eutrophication.

A small Florida lake has been receiving a regimen of nutrient addition equivalent to 500 mg/cu m-yr N and 43 mg/cu m-yr P since 1967. Data has been accumulated through 1969. The effect on the lacustrine ecosystem of various biogenes includes production by primary producers, species diversity of plankton and certain production estimates at the secondary trophic level using natural populations of planktivorous fish. Related studies on 53 other regional lakes have been done using a multidimensional hybrid concept as defined by several trophic state indicators. This trophic state index has provided a means for ranking the lakes on an arbitrary scale. Land use patterns and population characteristics were determined photographically and N and P budgets estimated. Several significant relationships were found between lake trophic state, lake basin, land use, and population characteristics. (Author)

PB-209 864
Wisconsin Univ., Madison. Water Resources Center.
PROBLEM LAKES IN THE UNITED STATES.
Water pollution control research series,
Martha J. Ketelle, and Paul D. Uttormark. Dec 71, 285p* W72-08987, EPA-16010-EHR-12/71
Paper copy available from GPO $2.00 as EP2.10:16010-EHR-12/71.

Descriptors: (*Lakes, *Limnology), (*United States, Lakes), Surveys, Inventories, Water pollution.
Identifiers: *Eutrophication.

A survey of 452 eutrophic lakes was compiled based on responses from 40 states requesting information as to (a) Name, location, size, depth; (b) Description of the problem, including accounts of previous corrective treatments, if any; (c) Remedial action that might be appropriate; (d) A description of available background data, indicating whether sufficient data exists to document a change if rehabilitation were undertaken. Categories of the problems in the survey were: nuisance algal growth, nuisance aquatic vegetation, fish-kills, bacterial contamination, toxic contamination, oil brines, unstable water levels, siltation, excessive dissolved solids, and unspecified eutrophic conditions. Sources contributing to

these problems were classified in two general categories-rconcentrated sources and diffused sources. Indication is given, where available, whether progress has been made to eliminate the pollution source. (Author)

PB-209 886
TRW Systems, Redondo Beach, Calif.
INVESTIGATION OF SCATTERED LIGHT HOLOGRAPHY OF AEROSOLS AND DATA REDUCTION TECHNIQUES,
B. J. Matthews, and R. F. Kemp. Nov 70, 75p
14103-6002-RO-00 APTD-1065
Contract EPA-CPA-70-4

Descriptors: (*Holography, *Aerosols), (*Particles, *Light scattering), (*Limestone, Steam boilers), (*Air pollution, Holography), Backscattering, Fly ash, Calcium carbonates, Concentration (Composition), Ruby lasers, Mathematical models, Computer programs, Photomicrography.
Identifiers: *Limestone injection, Air pollution control.

Investigation was initiated to increase the utility of the holographic technique in its application to limestone plume distribution studies. The following results were achieved with respect to the program objectives: The feasibility of holographically recording ruby laser backscatter from aerosols of flyash, chalk dust and incense; A mathematical model was derived which yields particle number density estimates from forward low angle scattered light intensity measurements of reconstructed holographic images recorded under specified conditions; Pulsed ruby laser holograms of a dioctyl phthalate aerosol of known characteristics were recorded and used to verify the derived mathematical model; A method of real image hologram reconstruction was demonstrated to facilitate direct measurement of scattered light intensities and corresponding spatial locations; A computer program of the derived mathematical model was written and utilized for particle number data reduction. The smoke particles corresponding in size to the wavelength of ruby light were recorded. The report describes the apparatus and methods used in each of these major tasks. (Author)

PB-269 890
Michigan Dept. of Natural Resources, Lansing. Bureau of Water Management.
CHLORINATED MUNICIPAL WASTE TOXICITIES TO RAINBOW TROUT AND FATHEAD MINNOWS.

Oct 71, 53p W72-09154, EPA-18050-GZZ-10/71
Paper copy available from GPO $0.60 as I67.13/4: 18050-GZZ-10/71.

Descriptors: (*Toxicity, *Fishes), (*Chlorination, *Industrial wastes), Aquatic biology, Urban areas, Water pollution, Sewage treatment, Water quality, Toxic tolerances, Trout, Minnows.
Identifiers: *Rainbow trout, *Fathead minnows.

Effect of chlorinated municipal wastes on fish life and laboratory findings of earlier researchers were assessed in separate studies at four Michigan municipal wastewater treatment plants. Tolerance levels and river length below each plant outfall rendered unavailable to resident fish populations were determined. Ten rainbow trout (Salmo gairdneri) and ten fathead minnows (Pimephales promelas), previously acclimated, were held 96 hours in live boxes in the stream above and below these outfalls. Fish held below these outfalls were subjected to both chlorinated and non-chlorinated exposures during effluent discharge. Test waters were monitored chemically and bacteriologically during fish exposure. Total residual chlorine concentrations below three plants were toxic to rainbow trout at distances up to 0.8 mile. Fathead minnows appeared adversely affected up to 0.6 mile downstream in two of the four plants. Total residual chlorine concentrations less than 0.1 mg/l were toxic to fathead minnows. Rainbow trout 96-hour total residual chlorine TL-50 concentration below two plants was 0.023 mg/l.

PB-209 893
Georgetown Univ., Washington, D.C.
USE OF GENERAL EQUILIBRIUM IN REGIONAL WATER RESOURCE PLANNING.
Water pollution control research series.

Jan 72, 165p W72-09228, EPA-16110-FIO-01/72
Paper copy available from GPO $1.50 as I67.13/4: 16110 FIO 01/72.

Descriptors: (*Regional planning, *Economic models), (*Water resources, Regional planning), Optimization, Prices, Supply (Economics), Control, Computer programs, Allocations, Equilibrium, Water pollution.

General equilibrium analysis is shown to be a feasible tool for estimating the optimal level of public goods in a regional economy and the optimal allocation of public funds to obtain the desired level. This analysis provides a methodology for investigating the externalities associated with various forms of production. An interaction or trade mechanism is presented which will force a regional economy into equilibrium with the economy in which it is embedded: Relative prices will be identical in these economies for their common commodities. A technique is presented by which all public goods can be treated in a general equilibrium framework. (Author)

PB-209 895
Wisconsin Univ., Madison. Water Resources Center.
DISTRIBUTIONAL ECOLOGY AND BEHAVIORAL THERMOREGULATION OF FISHES IN RELATION TO HEATED EFFLUENT FROM A STEAM-ELECTRIC POWER PLANT (LAKE MONONA, WISCONSIN).
Technical rept.,
Willima H. Neill, and John J. Magnuson. Mar 72, 110p W72-09236, OWRR-B-028-WIS (3)
Contract DI-14-01-001-3142

Descriptors: (*Water pollution, *Electric power plants), (*Fishes, *Ecology), Cooling water, Temperature, Zooplankton, Temperature gradients, Feeding habits, Seasonal variations, Fresh water biology.
Identifiers: *Thermal pollution, *Water pollution effects (Plants).

Lake Monona (Dane County, Wisconsin) provides water for cooling the condensers of a coal and gas fired power plant (220 Mw). After a 10C, water is returned to the lake. To assess the distributional responses of fish to the operation of the power plant, the outfall area and two reference areas were electro-fished thirty times over a one-year period. Some fishes found in the reference areas avoided the outfall area, whereas other fishes were at higher concentration in the outfall area relative to the reference sites. Integrated laboratory studies on six species and field results suggest that fishes were distributed within the outfall area according to their different temperature preferenda. (Author)

PB-209 932
Alamo Area Council of Governments, San Antonio, Tex.
BASIN MANAGEMENT FOR WATER REUSE.

Feb 72, 291p* W72-09381, EPA-16110-EAX-02/72
Paper copy available from GPO $2.25 as EP2.10: 16110-EAX-02/72.

Descriptors: (*Water supply, Water reclamation), (*Sewage treatment, *Water reclamation), Water treatment, Regional planning, Cost estimates, Computer programs, Seasonal variations, Texas, Activated carbon treatment, Calcium oxide, Clarification, Ion exchanging, Activated sludge process, Water pipelines.
Identifiers: Waste water reuse, Tertiary sewage treatment, San Antonio (Texas).

The project explored what is required and what happens if some or all of the sewage collected from a municipality is treated by advanced waste treatment (AWT) and put back in the water distribution system. Quality requirements and results of water reuse were examined by using computer programs for the preliminary design and costing of wastewater renovation by the lime-clinoptilolite-carbon processes of advanced waste treatment; for activated sludge treatment; and for pipeline conveyance of water. San Antonio, Texas was used as a specific case, at the two extremes of discharge all and reuse none and discharge none and reuse all. Costs for the conventional system and that reusing wastewater are discussed. (Author)

PB-209 933
Rex Chainbelt, Inc., Milwaukee, Wis.
A MATHEMATICAL MODEL OF A FINAL CLARIFIER.

Feb 72, 94p W72-09382, EPA-17090-FJW-02/72
Contract FWQA-14-12-194
Paper copy available from GPO $1.00 as EP2.10: 17090 FJW-02/72.

Descriptors: (*Sewage treatment, Clarification), (*Clarification, Mathematical models), Clarifiers, Settling, Concentration (Composition), Solids, Activated sludge process, Hydraulics, Design criteria.

The final clarifier in the activated sludge process performs a vital role in secondary waste treatment systems. The purpose of the project was to develop a mathematical model to predict the solids concentration of both the underflow and overflow of a final clarifier as a function of the mixed liquor characteristics. It was concluded that neither the effluent suspended solids nor the return sludge concentration can be estimated with good accuracy from those parameters which are normally available to the design engineer. Recommendations for future work which would enable a more realistic approach to the preliminary design of final clarifiers are made. (Author)

PB-209 934
Battelle-Northwest, Richland, Wash.
WASTEWATER AMMONIA REMOVAL BY ION EXCHANGE.
Feb 71, 110p W72-09383, EPA-17010-ECZ-02/71
Contract FWQA-14-12-561
Prepared in cooperation with South Tahoe Public Utility District, South Lake Tahoe, Calif.
Paper copy available from GPO $1.25 as EP2.10: 17010-ECZ-02/71.

Descriptors: (*Ammonia, *Ion exchanging), (*Chemical removal (Sewage treatment), Ammonia), (*Sewage treatment, Ammonia), Design criteria, Ion exchange resins, Ammonium compounds, Columns (Process engineering), Pilot plants, Regeneration (Engineering), Reclamation, Strippers, Electrolysis, Cost estimates, Capital costs, Operating costs, Engineering design, California.
Identifiers: Clinoptilolite, Zeolites, Tertiary sewage treatment, Lake Tahoe.

Pilot plant investigations of a nitrogen removal system employing a natural zeolite, clinoptilolite, which is selective for ammonium ions in the presence of sodium, magnesium, and calcium ions, were conducted. The system was operated on both clarified and carbon treated secondary effluent and clarified raw sewage. Regeneration was accomplished by reacting the exhausted zeolite with hydroxyl ions to form an alkaline aqueous ammonia solution suitable for air stripping and discharge to the atmosphere. The regenerant solu-

tion is not discarded and no liquid wastes are generated. A 7 1/2 mgd plant was designed based on the pilot plant data. Estimates for operational costs and construction costs, based on current costs are given. (Author)

PB-209 935
Culligan International Co., Northbrook, Ill.
WASTEWATER DEMINERALIZATION BY ION EXCHANGE.
Water pollution control research series.

Dec 71, 134p W72-09384, EPA-17040-EEE-12/71
Contract FWQA-14-12-599
Paper copy available from GPO $1.25 as EP2.10: 17040-EEE-12/71.

Descriptors: (*Sewage treatment, *Ion exchanging), (*Demineralizing, Sewage treatment), (*Water reclamation, Sewage treatment), Activated sludge process, Chemical removal (Sewage treatment), Phosphates, Design criteria, Cation exchanging, Sewage filtration, Cost estimates, Waste disposal, Performance evaluation.
Identifiers: Waste water reuse, Liquid waste disposal, Tertiary sewage treatment.

The feasibility of wastewater demineralization by ion exchange procedures was successfully demonstrated by pilot plant studies conducted on sewage effluent from an activated sludge treatment plant. A pretreatment unit consisting of lime clarification, dual media filtration, and granular activated carbon filtration was operated in series with the ion exchange system. Phosphate reductions were achieved by lime clarification at pH 10.0, but identical reductions were achieved by ion exchange alone. In addition ion exchange treatment without lime was cheaper. Ion exchange processes using strong acid cation exchange resin and weak base anion exchange resin can be readily applied to wastewater demineralization. Design of treatment plants for such a process applied to wastewater containing as much as 500 mg/l of ionizable solids can use established design parameters. Disposal of sludges and saline liquids must be considered.

PB-209 936
Crowley's Milk Co., Binghamton, N.Y.
MEMBRANE PROCESSING OF COTTAGE CHEESE WHEY FOR POLLUTION ABATEMENT.
Water pollution control research series.

Jul 71, 118p W72-09385, EPA-12060-DXF-07/71
Paper copy available from GPO $1.25 as EP2.10: 12060-DXF-07/71.

Descriptors: (*Water pollution, *Dairy products), (*Industrial waste treatment, Dairy products), (*Food processing, Industrial waste treatment), (*Osmosis, Industrial waste treatment), Pilot plants, Performance evaluation, Cost estimates, Capital costs, Operating costs, Membranes, Lactose, Proteins, Lactic acid, Microbiology, Waste disposal.
Identifiers: *Whey, *Reverse osmosis, *Water pollution control, Cottage cheese whey, Food supplements, *Ultrafiltration.

An ultrafiltration reverse osmosis system for the treatment of cottage cheese whey has been successfully demonstrated on both the laboratory and pilot plant scale. A protein concentrate is recovered in the ultrafiltration step and the remaining deproteinized whey is concentrated by reverse osmosis to provide a lactose concentrate. Both concentrates can either be processed further or used directly as liquids. Membrane life was excellent and membrane fluxes were economically high. Costs are given which include the income from the sale of protein and lactose substitutes.

PB-209 937
Missouri Basin Engineering Health Council, Cheyenne, Wyo.
WASTE TREATMENT LAGOONS - STATE OF THE ART.
Water pollution control research series.

Jul 71, 156p W72-09386, EPA-17090-EHX-07/71
Paper copy available from GPO $1.25 as EP2.10: 17090-EHX-07/71.

Descriptors: (*Sewage treatment, *Lagoons (Ponds)), (*Reviews, Lagoons (Ponds)), Oxidation, Aeration, Anaerobic processes, Aerobic processes, Microbiology, Design criteria.
Identifiers: Aeration ponds, *Sewage lagoons, Anaerobic lagoons.

A review of published literature and field evaluations revealed the presence of over 3500 waste treatment lagoons currently in operation in the United States. The three types of lagoons in use include: Oxidation lagoons; Aerated lagoons; and Anaerobic lagoons. Oxidation lagoons depend upon algae to supply oxygen by photosynthesis and degrade the waste products. Effluent quality is determined by the quantity of algae in the effluent and several methods of algae removal are currently under investigation. Aerated lagoons may be merely oxidation ponds with supplemental aeration, partially mixed activated sludge (facultative aerated) or complete mix activated sludge (CMAS) systems. Anaerobic lagoons can provide up to 80% BOD removals, but must be followed by some type of aerobic treatment to produce a high quality effluent. The review has demonstrated that lagoons do have applicability to the total waste treatment problem.

PB-209 938
Gainesville Dept. of Public Utilities, Fla.
MAGNESIUM CARBONATE, A RECYCLED COAGULANT FOR WATER TREATMENT.
Water pollution control research series.

Jun 71, 116p W72-09387, EPA-12120-FSW-06/71
Paper copy available from GPO $1.00 as EP2.10: 12120-ESW-06/71.

Descriptors: (*Water treatment, *Clarification), (*Coagulants, *Magnesium carbonates), (*Coagulation, Water treatment), Precipitation (Chemistry), Magnesium hydroxides, Calcium oxides, Performance evaluation, Sludge disposal, Reclamation, Regeneration (Engineering), Cost estimates, Operating costs, Chemical reactions, Decoloring.

Laboratory investigations into the use of magnesium carbonate instead of alum for coagulation have demonstrated that the magnesium carbonate system produces a treated water with superior characteristics compared to water treated with alum. Both turbidity and organic color removals were comparable for both processes, and the flocs formed by the magnesium carbonate process were larger and heavier than alum flocs with better settling characteristics. The process involves the use of the magnesium carbonate as a coagulant and lime is added to precipitate gelatinous Mg (OH)2. The sludge, composed of a slurry of Mg (OH)2, CaCO3, and clay is carbonated and the Mg (OH)2 selectively and completely dissolved. Recycle after filtering allows re-use of both the magnesium carbonate and the sludge water. CaCO3 can also be recovered easily in large plants or landfilled at small ones. Chemical treatment costs for most waters can be substantially reduced using this system, while the quality of treated water will be superior to the quality of alum-treated water. (Author)

PB-209 939
North American Rockwell Corp., Canoga Park, Calif. Atomics International Div.
PHOSPHATE PRECIPITATION WITH FERROUS IRON,
Masood Ghassemi, and Howard L. Recht. Sep 71, 71p W72-09388, EPA-17010-EKI-09/71
Contract FWQA-14-12-817
Paper copy available from GPO $0.70 as I67.13/4:17010-EKI-09/71.

Descriptors: (*Phosphates, *Chemical removal (Sewage treatment)), (*Sewage treatment, Phosphates), Coagulation, Precipitation (Chemistry), Iron inorganic compounds, pH, Reaction kinetics, Concentration (Composition), Aluminum inorganic compounds, Oxygen, Dissolved gases, Solubility, Settling, Pickling compositions, Industrial wastes, Oxidation, Waste disposal.
Identifiers: Waste water reuse, Precipitants, Liquid waste disposal.

Of a number of methods available for phosphate removal from waste water, chemical precipitation (often called coagulation) using aluminum, ferric iron, ferrous iron and lime is considered to be the most economical. The objective of the present study has been two-fold: To evaluate the effects of pH and reactant concentration on the rate and efficiency of phosphate removal from synthetic and secondary effluent wastewaters and on the nature of the precipitates formed; and to compare the data on the Fe (II)-phosphate precipitation system with the available data for Fe (III)- and Al (III)-phosphate systems. Most of the experiments in the study were conducted on pure orthophosphate solutions and in the absence of dissolved oxygen. Only a limited number of tests were made of the use of ferrous iron for orthophosphate removal from wastewaters containing dissolved oxygen. (Author)

PB-209 940
Union Carbide Corp., Tonawanda, N.Y. Linde Div.
CONTINUED EVALUATION OF OXYGEN USE IN CONVENTIONAL ACTIVATED SLUDGE PROCESSING.
Water pollution control research series.

Feb 72, 162p W72-09389, EPA-1 /050-DNW-02/72
Contract FWQA-14-12-867
Paper copy available from GPO $1.50 as I67.13/4: 17050-DNW-02/72.

Descriptors: (*Activated sludge process, *Oxygenation), (*Sewage treatment, Activated sludge process), Oxygen, Performance evaluation, Sewage filtration, Sludge digestion, Vacuum filtration, Cost estimates, Settling, Aerobic processes.

A process (called UNOX) for treating municipal wastewater using high-purity oxygen in the activated sludge process was further evaluated at Batavia, New York in a full scale wastewater treatment plant. The present evaluation places emphasis on the production rate, filtration, and digestion characteristics of oxygenated waste activated sludge. Operation was conducted at two different system loadings over a period of three months. The filtering characteristics of waste activated sludge from an oxygenation system were investigated. Waste activated sludge was aerobically digested in 800-gallon batches using high-purity oxygen. The economics of oxygenation systems as compared with conventional diffused air aeration systems were revised from the cost estimates presented in initial work. (Author)

PB-209 941
National Canners Association, Berkeley, Calif. Western Research Lab.
LIQUID WASTES FROM CANNING AND FREEZING FRUITS AND VEGETABLES.
Aug 71, 164p* W72-09390, EPA-12060-EDK-08/71
Paper copy available from GPO $1.50 as I67.13/4:12060-EDK-08/71.

Descriptors: (*Food processing, *Industrial waste treatment), (*Waste disposal, Food processing), Reviews, Industrial wastes, Canneries, Vegetables, Fruits, Frozen foods, Water consumption, Peeling, Industrial water, Nutrients, Solids, Biochemical oxygen demand, Irrigation, Lagoons (Ponds), Cost estimates, Operating costs, Capital costs, Water pollution.
Identifiers: Biological industrial waste treatment, Solid waste disposal, *Liquid waste disposal, Aeration ponds, *Water pollution control.

It has been estimated that the approximately 1800 plants in the canned and frozen fruits and vegetables industry in the U.S. annually utilize 26 million tons of raw product, discharge 83 billion gallons of wastewater, generate 800 million pounds of BOD and 392 million pounds of suspended solids, and produce 8 million tons of solid residuals. Flow diagrams are presented for peaches, peas, corn, beets, and tomato products, and proportions of the total liquid waste flow, BOD, and SS from each of 5 or 6 processing steps for 15 commodities are estimated. Several conventional waste treatment methods are presented, along with their potential application to the food processing industry. Liquid waste treatment and/or discharge costs for a synthetic average plant in the industry are estimated including annual capital and operation and maintenance costs. Seven hundred references are listed.

PB-209 945
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XIV. TECHNICAL PAPERS FROM THE LENINGRAD INTERNATIONAL SYMPOSIUM ON THE METEOROLOGICAL ASPECTS OF ATMOSPHERIC POLLUTION. PART III,
M. Y. Nuttonson. May 72, 134p AICE-AIR-72-14 APTD1145
Grant EPA-R-800878

Descriptors: (*Air pollution, *USSR), (*Atmospheric diffusion, Air pollution), (*Urban areas, Air pollution), Meteorology, Precipitation (Meteorology), Sulfur dioxide, Gas detectors, Metals, East Germany, Smog, Photochemical reactions, Oxidizers, Cloud seeding, Siberia, Microclimatology, Public health, Urban planning.
Identifiers: Precipitation washout, *Air pollution detection.

Fifteen papers were translated: On the removal of impurities from the atmosphere by clouds and precipitation; Some aspects of the adoption of automatic methods of determining atmospheric pollutants; Recording of sulfur dioxide content at the outskirts of a city. Comparison of measurement results for a valley and an elevation; Theoretical and Experimental study of the aspiration coefficient of aerosols; Mechanism of photochemical pollution of the urban atmosphere; Procedure for determining the content of trace elements in precipitated water; Content of heavy metals in the air of certain regions of the USSR; On the design of a measuring network for air pollution in the German Democratic Republic; Content of photooxidants in urban air; Study of air pollution and atmospheric precipitation resulting from artificial modification of clouds; Microclimatic characteristics and hygienic evaluation of the relative emplacement of industrial and residential complexes in the regions of Siberia; Numerical characteristics of meteorological conditions associated with periods of heavy atmospheric pollution in western Siberia; Experience in simulating the propagation of noxious substances in the surface atmospheric layer over plant sites and surrounding grounds; Special cases of Vertical currents; and Synoptic conditions of formation of a very stable atmospheric boundary layer.

PB-209 951
TRW Systems Group, Redondo Beach, Calif.
THE ECONOMIC EFFECTIVENESS OF MANDATORY ENGINE MAINTENANCE FOR REDUCING VEHICLE EXHAUST EMISSIONS. VOLUME I. EXECUTIVE SUMMARY.

9 Aug 71, 55p* APTD-1073
Contract CPA-22-69-087
See also Volume 2, PB-209 952.

Descriptors: (*Automobiles, Inspection), (*Air pollution, Exhaust gases), (*Automobile engines, *Exhaust gases), Maintenance, Economic analysis, Cost estimates, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Statistical analysis, Gas sampling, Cost effectiveness, Spectrum signatures, Infrared spectroscopy.
Identifiers: *Motor vehicle inspection, *Automobile exhaust, Air pollution abatement.

The report summarizes the results of research on the effects of mandatory vehicle inspection and maintenance which were investigated to assess the most cost-effective procedures for periodically diagnosing and restoring to specification those engine components having significant effects on vehicle exhaust emissions. Typical average emission reductions over a four year period are given. It was found that the most cost effective inspection frequency is once yearly using state inspection lanes and nondispersive, infrared emission measurement instruments.

PB-209 952
TRW Systems Group, Redondo Beach, Calif.
THE ECONOMIC EFFECTIVENESS OF MANDATORY ENGINE MAINTENANCE FOR REDUCING VEHICLE EXHAUST EMISSIONS. VOLUME II. MODELING OF INSPECTION/MAINTENANCE SYSTEMS.

Jan 72, 101p APTD-1074
Contract CPA-22-69-087
See also Volume 1, PB-209 951 and Volume 3, PB-209 953.

Descriptors: (*Automobiles, Inspection), (*Air pollution, Exhaust gases), (*Automobile engines, Exhaust gases), Maintenance, Mathematical modes, Cost effectiveness, Economic analysis, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Economic models, Statistical analysis, Cost estimates, Spectrum signatures.
Identifiers: *Motor vehicle inspection, *Automobile exhaust, Air pollution abatement.

The effects of mandatory vehicle inspection and maintenance for maintaining air pollution emission standards were investigated. The development of the inspection/maintenance (I/M) economic effectiveness model and the study results are described. A literature survey was made and direct discussions were held with automobile manufacturers and automobile associations to acquire applicable cost and operational data and to identify candidate inspection/maintenance procedures. Statistical evaluations of acquired data were performed to develop models of inspection procedures, maintenance effectiveness and deterioration and capital costs. An internally consistent system model was constructed using both contract developed and acquired data to evaluate the economic effectiveness of four candidate inspection/maintenance strategies.

PB-209 953
TRW Systems Group, Redondo Beach, Calif.
THE ECONOMIC EFFECTIVENESS OF MANDATORY ENGINE MAINTENANCE FOR REDUCING VEHICLE EXHAUST EMISSIONS. VOLUME III. INSPECTION/MAINTENANCE PROCEDURES DEVELOPMENT.

20 Aug 71, 194p APTD-1075
Contract CPA-22-69-087
See also Volume 2, PB-209 952.

Descriptors: (*Automobiles, Inspection), (*Air pollution, Exhaust gases), (*Automobile engines, *Exhaust gases), Experimentation, Maintenance, Feasibility studies, Economic models, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Tests, Carburetors, Air cleaners.
Identifiers: *Motor vehicle inspection, *Automobile exhaust, Air pollution abatement.

The experiments performed to develop, characterize, and rank motor vehicle inspection and maintenance procedures to maintain air pollution emission standards are described. The experimental data were developed from the following sequence of investigations: An engine parameter field survey to characterize the general maintenance state of vehicle emission control systems; A screening experiment to select the most frequent and extensive malfunctioned engine parameters; and a definitive experiment to select and evaluate the most effective parameters to maintain in an inspection as determined by combining the data from the previous two experiments. These experiments were designed to yield a consistent set of data to support the emissions models. Inspection procedures using both direct engine parameter and emission diagnosis were developed with these data.

PB-209 954
Industrial Nucleonics Corp., Columbus, Ohio.
DEVELOPMENT OF A NUCLEONIC PARTICULATE EMISSION GAUGE.
Final rept.,
Charles R. Duke, and Boong Y. Cho. 25 Feb 72, 64p* APTD-1150
Contract EPA-68-02-0210

Descriptors: (*Air pollution, Particles), (*Gas detectors, *Particles), (*Exhaust gases, Particles), Beta particles, Laboratory equipment, Filter materials, Design, Radiation measuring instruments, Field tests, Automobile engines, Lead.
Identifiers: *Air pollution detection, Automobile exhaust.

A project was conducted to design, fabricate, and test a particulate emission monitor utilizing a beta radiation attenuation and filter sampler technique. The instrument was to have a minimum sensitivity of 125 plus or minus 25 micrograms per cubic meter and be capable of operation in either a manual or automatic mode of operation. Carbon-14 was selected as the optimum isotope and a filter 'cassette' was used to collect the particles. The effect of moisture absorption by various types of filter media were investigated and reported. A series of tests were performed on automobiles using leaded, low-leaded and non-leaded fuels. The results of these tests are reported as well as recommendations for future effort. (Author)

PB-209 964
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF ALABAMA.

May 71, 21p* APTD-1026

Descriptors: (*Real property, *National government, *Air pollution, *Alabama), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 965
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF ALASKA.
Jun 71, 22p APTD-1027

Descriptors: (*Real property, *National government), (*Air pollution, *Alaska), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 966
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF ARIZONA.
May 71, 21p APTD-1025

Descriptors: (*Real property, *National government), (*Air pollution, *Arizona), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 967
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF ARKANSAS.
May 71, 19p APTD-1024

Descriptors: (*Real property, *National government), (*Air pollution, *Arkansas), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 968
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF CALIFORNIA.
May 71, 46p APTD-1023

Descriptors: (*Real property, *National government), (*Air pollution, *California), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 969
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF COLORADO.
May 71, 21p APTD-1022

Descriptors: (*Real property, *National government), (*Air pollution, *Colorado), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 970
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF CONNECTICUT.
May 71, 17p APTD-1021

Descriptors: (*Real property, *National government), (*Air pollution, *Connecticut), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 971
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF DELAWARE.
May 71, 17p APTD-1020

Descriptors: (*Real property, *National government), (*Air pollution, *Delaware), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 972
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE DISTRICT OF COLUMBIA.
Jun 71, 18p APTD-1019

Descriptors: (*Real property, *National government), (*Air pollution, *District of Columbia), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 973
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF FLORIDA.
May 71, 26p APTD-1017

Descriptors: (*Real property, *National government), (*Air pollution, *Florida), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 974
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF GEORGIA.
May 71, 24p APTD-1018

Descriptors: (*Real property, *National government), (*Air pollution, *Georgia), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 975
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF HAWAII.
May 71, 15p APTD-1015

Descriptors: (*Real property, *National government), (*Air pollution, *Hawaii), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 976
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF IDAHO.
May 71, 18p APTD-1016

Descriptors: (*Real property, *National government), (*Air pollution, *Idaho), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 977
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF ILLINOIS.
May 71, 31p APTD-1014

Descriptors: (*Real property, *National government), (*Air pollution, *Illinois), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 978
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF INDIANA.
May 71, 23p APTD-1064

Descriptors: (*Real property, *National government), (*Air pollution, *Indiana), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 979
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF IOWA.
May 71, 21p APTD-1063

Descriptors: (*Real property, *National government), (*Air pollution, *Iowa), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 980
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF KANSAS.
Jun 71, 21p APTD-1062

Descriptors: (*Real property, *National government), (*Air pollution, *Kansas), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 981
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF KENTUCKY.
Jun 71, 21p APTD-1061

Descriptors: (*Real property, *National government), (*Air pollution, *Kentucky), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 982
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF LOUISIANA.
May 71, 21p APTD-1060

Descriptors: (*Real property, *National government), (*Air pollution, *Louisiana), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 983
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF MAINE.
Jun 71, 20p APTD-1059

Descriptors: (*Real property, *National government), (*Air pollution, *Maine), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 984
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF MARYLAND.
Jun 71, 23p APTD-1058

Descriptors: (*Real property, *National government), (*Air pollution, *Maryland), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 985
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF MASSACHUSETTS.
May 71, 27p APTD-1057

Descriptors: (*Real property, *National government), (*Air pollution, *Massachusetts), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 986
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF MICHIGAN.
Jun 71, 27p APTD-1056

Descriptors: (*Real property, *National government), (*Air pollution, *Michigan), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 987
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF MINNESOTA.
Jun 71, 22p APTD-1055

Descriptors: (*Real property, *National government), (*Air pollution, *Minnesota), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 988
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF MISSISSIPPI.
Jun 71, 20p APTD-1054

Descriptors: (*Real property, *National government), (*Air pollution, *Mississippi), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 989
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF MISSOURI.
Jun 71, 24p APTD-1053

Descriptors: (*Real property, *National government), (*Air pollution, *Missouri), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 990
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF MONTANA.
Jun 71, 20p APTD-1052

Descriptors: (*Real property, *National government), (*Air pollution, *Montana), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 991
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF NEBRASKA.
Jun 71, 18p APTD-1051

Descriptors: (*Real property, *National government), (*Air pollution, *Nebraska), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 992
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF NEVADA.
Jun 71, 17p APTD-1050

Descriptors: (*Real property, *National government), (*Air pollution, *Nevada), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 993
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF NEW HAMPSHIRE.
Jun 71, 16p APTD-1049

Descriptors: (*Real property, *National government), (*Air pollution, *New Hampshire), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 994
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF NEW JERSEY.
Jun 71, 23p APTD-1048

Descriptors: (*Real property, *National government), (*Air pollution, *New Jersey), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 995
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF NEW MEXICO.
Jun 71, 20p APTD-1047

Descriptors: (*Real property, *National government), (*Air pollution, *New Mexico), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 996
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF NEW YORK.
Jun 71, 36p APTD-1046

Descriptors: (*Real property, *National government), (*Air pollution, *New York), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 997
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF NORTH CAROLINA.
Jun 71, 23p APTD-1045

Descriptors: (*Real property, *National government), (*Air pollution, *North Carolina), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 998
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF NORTH DAKOTA.
Jun 71, 19p APTD-1044

Descriptors: (*Real property, *National government), (*Air pollution, *North Dakota), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-209 999
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF OHIO.
Jun 71, 31p APTD-1043

Descriptors: (*Real property, *National government), (*Air pollution, *Ohio), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 000
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF OKLAHOMA.
Jun 71, 22p APTD-1042

Descriptors: (*Real property, *National government), (*Air pollution, *Oklahoma), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 001
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF OREGON.
Jun 71, 23p APTD-1041

Descriptors: (*Real property, *National government), (*Air pollution, *Oregon), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 002
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF PENNSYLVANIA.
Jun 71, 32p APTD-1040

Descriptors: (*Real property, *National government), (*Air pollution, *Pennsylvania), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 003
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF RHODE ISLAND.
Jun 71, 16p APTD-1039

Descriptors: (*Real property, *National government), (*Air pollution, *Rhode Island), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 004
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF SOUTH CAROLINA.
Jun 71, 19p APTD-1038

Descriptors: (*Real property, *National government), (*Air pollution, *South Carolina), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 005
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF SOUTH DAKOTA.
Jun 71, 18p APTD-1037

Descriptors: (*Real property, *National government), (*Air pollution, *South Dakota), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 006
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF TENNESSEE.
Jun 71, 23p APTD-1036

Descriptors: (*Real property, *National government), (*Air pollution, *Tennessee), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 007
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF TEXAS.
Jun 71, 40p APTD-1035

Descriptors: (*Real property, *National government), (*Air pollution, *Texas), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 008
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF UTAH.
Jun 71, 19p APTD-1034

Descriptors: (*Real property, *National government), (*Air pollution, *Utah), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 009
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF VERMONT.
Jun 71, 15p APTD-1033

Descriptors: (*Real property, *National government), (*Air pollution, *Vermont), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 010
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF VIRGINIA.
Jun 71, 27p APTD-1032

Descriptors: (*Real property, *National government), (*Air pollution, *Virginia), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 011
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF WASHINGTON.
Jun 71, 28p APTD-1031

Descriptors: (*Real property, *National government), (*Air pollution, *Washington (State)), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 012
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF WEST VIRGINIA.
Jun 71, 19p APTD-1030

Descriptors: (*Real property, *National government), (*Air pollution, *West Virginia), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 013
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF WISCONSIN.
Jun 71, 22p APTD-1029

Descriptors: (*Real property, *National government), (*Air pollution, *Wisconsin), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 014
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
REAL PROPERTY OWNED BY THE FEDERAL GOVERNMENT IN THE STATE OF WYOMING.
Jun 71, 17p APTD-1028

Descriptors: (*Real property, *National government), (*Air pollution, *Wyoming), Inventories, Distribution (Property), Regions, Urban areas, Buildings.

The series of reports is a summary compilation of the major facilities of real property owned by the Federal Government in the various states. The installations are listed alphabetically by the city in which they are located and the listing includes a brief description of the installation, the agency which operates the facility, the GSA inventory number, the GSA location code, the total floor area of all the buildings and a size classification code. The operating agency and installation descriptions are those reported to the General Services Administration as of June 30, 1970. Installations with a total floor area less than 1,500 sq. ft. have been omitted since experience indicates that they do not present any air pollution potential. For prices of individual reports, see below:

PB-210 017
Stanford Research Inst., Menlo Park, Calif.
REGIONAL AIR POLLUTION STUDY: A PROSPECTUS. PART I. SUMMARY.
Final rept.
Jan 72, 102p* APTD-1122
Contract EPA-68-02-0207
See also Part 2, PB-210 018.

Descriptors: (*Air pollution, Research management), (*Regional planning, Air pollution), Mathematical models, Site surveys, Laboratories, Objectives, Abatement, Atmospheric physics, Public health, Economic analysis, Meteorological data, Sources, Inventories, Data processing, Cost estimates, Research projects.
Identifiers: Regional air pollution study.

The problem of effectively managing air quality within the framework of current legislation on a regional basis is extensive and complex. The need to evaluate and improve control strategies already adopted or to identify new approaches must be considered on this basis. By effectively coordinating efforts on a number of interrelated problems, a combination of resources can be brought to bear on the problems of air quality management. It is the purpose of the Prospectus to identify the separate elements constituting such an undertaking and to describe how it can be carried out. In the report the major concept of RAPS (Regional air pollution study) is presented, with an outline description of the Research Plan, the Facility, and the Management Plan (which includes budgetary information).

PB-210 018
Stanford Research Inst., Menlo Park, Calif.
REGIONAL AIR POLLUTION STUDY: A PROSPECTUS. PART II. RESEARCH PLAN.
Final rept.

Jan 72, 280p APTD-1123
Contract EPA-68-02-0207
See also Part 1, PB-210 017 and Part 3, PB-210 019.

Descriptors: (*Air pollution, Research management), (*Research projects, Air pollution), (*Atmospheric physics, Air pollution), Reviews, Research projects, Atmospheric models, Inventories, Concentration (Composition), Sources, Exhaust gases, Combustion products, Economic analysis, Sociology, Sulfur dioxide, Oxidizers, Nitrogen oxides, Carbon monoxide, Smog, Hydrocarbons, Regional planning.
Identifiers: Regional air pollution study, Technology transfer.

The report describes the research plan to be used in the Regional Air Pollution Study (RAPS) which is being developed to aid in improving and controlling regional air quality. A comprehensive overview is provided of the three principal components contained in the process of air pollution: Meteorological processes; Atmospheric chemistry and transformation processes; and The emissions sources The specific research tasks to be carried out are defined. The contents include: Overview of air pollution modeling; Meteorological processes; Atmospheric chemistry and transformation processes; Emission estimates; Economic and social impact studies; and [illegible]logy transfer.

PB-210 019
Stanford Research Inst., Menlo Park, Calif.
REGIONAL AIR POLLUTION STUDY: A PROSPECTUS. PART III. RESEARCH FACILITY.
Final rept.

Jan 72, 187p APTD-1124
Contract EPA-68-02-0207
See also Part 2, PB-210 018 and Part 4, PB-210 020.

Descriptors: (*Air pollution, Research management), (*Laboratories, Air pollution), Research projects, Design, Gas sampling, Monitors, Data processing, Atmospheric physics, Missouri, Laboratory equipment, Sulfur dioxide, Carbon monoxide, Nitrogen oxides, Particles, Oxidizers, Regional planning.
Identifiers: Regional air pollution study, Air pollution sampling, Saint Louis (Missouri).

The conceptual definition and detailed discussion of the permanent instrument, data-handling, and processing facility planned for the Regional Air Pollution Study (RAPS) are presented. The facility, by its design and mode of operation, is intended to provide the basic support to the research efforts. The St. Louis, Missouri facility is conceived as consisting of a system of air quality and meteorological instrument stations established within an area roughly enclosed by a circle of 100-km radium with the St. Louis arch as its center. A central support facility is also planned, which includes data-handling and processing equipment, office and laboratory space, and repair and maintenance shops. (Author)

PB-210 020
Stanford Research Inst., Menlo Park, Calif.

REGIONAL AIR POLLUTION STUDY: A PROSPECTUS. PART IV. MANAGEMENT PLAN.
Final rept.

Jan 72, 174p APTD-1125
Contract EPA-68-02-0207
See also Part 3, PB-210 019.

Descriptors: (*Air pollution, Research management), (*Laboratories, Air pollution), Personnel selection, Cost estimates, Operating costs, Capital costs, Laboratory equipment, Data processing, Missouri.
Identifiers: Regional air pollution study, Saint Louis (Missouri).

Findings largely applicable to the scheduling, management and staffing, and the estimated costs of the St. Louis Regional Air Pollution Study facility are presented. The planning factors are regarded as having an accuracy and reliability suitable for planning purposes and for the purpose of providing a working format for additional and more detailed planning efforts. The contents include: Implementation Schedule of the St. Louis Facility; Permanent Management and Staffing; St. Louis Facility Initial Costs and Annual Operating Costs; and Research Plan Costs. (Author)

PB-210 057
Sundstrand Aviation, Rockford, Ill.
HYBRID PROPULSION SYSTEM TRANSMISSION EVALUATION. PHASE I.
Final rept.,
M. A. Cordner, and D. H. Grimm. 25 Feb 72, 388p*
SA/AER-640 APTD-1121
Contract EPA-68-04-0034

Descriptors: (*Motor vehicles, *Air pollution), (*Automotive transmissions, Performance evaluation), Motor vehicle drive systems, Flywheels, Feasibility, Cost estimates, Design, Automobiles, FORTRAN, Computer programs, Analog simulation, Digital simulation.
Identifiers: *Hybrid vehicular propulsion, Air pollution abatement, *Hydromechanical transmissions.

The purpose was to assess the practicality of a transmission for use in a heat engine/flywheel propulsion system to reduce emissions. The system was to be suitable for incorporation into a full size 'family car' automobile. The different possible link types (mechanical, hydrostatic, and hydromechanical) between the engine, flywheel, and vehicle wheels were analyzed. Many transmission schematics were investigated, and several combinations were selected for further evaluation resulting in the final recommended configuration. Controls were selected and analyzed using a digital dynamic simulation computer program and an analog computer simulation. System performance, stability and driveability were deterined. Cost estimates were made for the selected configuration using comparative data, vendor quotations and in-house estimates. Comparisons with a conventional three speed automatic transmission were made. A hydromechanical transmission configuration with interdependent links between the flywheel, engine, and wheels was the resultant selection. The flywheel/transmission was configured for a tranaxle installation, which was considered optimum. (Author)

PB-210 110
Pacific Northwest Water Lab., Corvallis, Oreg.
DISPOSAL OF SOLID ALUMINUM PROCESS WASTES IN THE OCEAN,
Donald J. Baumgartner, Richard J. Callaway, and George R. Ditsworth. Dec 69, 24p Working Paper-64 W72-09552, EPA-16070-12/69

Descriptors: (*Water pollution, *Industrial wastes), (*Aluminum industry, Water pollution), (*Waste disposal, *Oceans), Pacific Ocean, Cyanides, Calcium fluorides, Calcium carbonates, Aluminum oxides, Site surveys.
Identifiers: *Ocean waste disposal, *Solid waste disposal, Columbia River.

The probable effect of dumping solid aluminum process wastes at one of three localities in the Pacific Ocean approximately 40 mi off the mouth of the Columbia River is discussed. A description of the material is given and detailed chemical and physical characteristics of each material are given in three tables. Pollution aspects and possible pollution problems are described. Dumping of the residue is to be at a rate of 1000 tons per day for 175 days. In addition, 1000 tons per day of lime mud is to be dumped within an 8-day period.

PB-210 111
Pacific Northwest Water Lab., Corvallis, Oreg.
DESIGN AND CONSTRUCTION OF A SALT-WATER ENVIRONMENT SIMULATOR,
Waldemar A. DeBen. Apr 70, 36p Working Paper-71 W72-09553, EPA-16070-04/70

Descriptors: (*Environment simulators, *Estuaries), Design, Performance evaluation, Dissolved gases, Salinity, Ecology, Aquatic biology, Automatic control, Temperature control, Water pollution.

An experimental, continuous-flow bioassay apparatus was designed to utilize and stabilize salt water derived from an estuarine source. The prototype was constructed to provide a single-test supply of up to 8 liters of water per minute at 4 levels of selected temperature and a near-constant concentration of any selected salinity or dissolved oxygen. Called the 'Saltwater Environment Simulator', this apparatus is intended for use in evaluating pollution effects and natural environmental changes on marine and estuarine animals. The experimental procedure is described and illustrated with drawings of the simulator. Tests indicate that controlled environmental conditions can be provided to define some of the physiological requirements of test animals living under estuarine conditions that can be related to ecological field studies.

PB-210 112
Pacific Northwest Water Lab., Corvallis, Oreg.
SALINITY, RUNOFF AND WIND MEASUREMENTS YAQUINA ESTUARY, OREGON,
Richard J. Callaway, George R. Ditsworth, and D. L. Cutchin. Mar 70, 50p Working Paper-70 W72-09554, EPA-16070-03/70

Descriptors: (*Estuaries, Salinity), (*Surface water runoff, Estuaries), (*Meteorological data, *Oregon), Hydrology, Wind velocity, Data processing, Water table, Data storage, Computer programming.
Identifiers: *Yaquina Bay.

The data collection program was intended for two purposes: (1) to provide data for verification of a solution of the advection-diffusion equation, and (2) to provide long, continuous records on which to test certain hypotheses related to time-series analysis. Conductivity data were collected with battery-powered recording conductivity meters. Wind speed and direction data were collected with a Climet wind recording system and a Geodyne wind recorder. Water levels were continuously recorded. (Author)

PB-210 124
Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
RESEARCH ON THE PHYSICAL ASPECTS OF THERMAL POLLUTION.

Feb 71, 205p W72-09728, EPA-WQO-16130-DPU-02/71
Contract FWQA-14-12-526
Paper copy available from GPO $1.75 as stock no. 5501-0143, EP 2.10:16130-DPU-02/71.

Descriptors: (*Water pollution, Heat), (*Lakes, Temperature distribution), Thermoclines, Mixing, Turbulent diffusion, Seasonal variations, Plumes, Mathematical models, Interfaces, Electric power plants, Stratification.
Identifiers: *Thermal pollution.

The mechanisms of formation and maintenance of the characteristic thermal structure of deep, temperate lakes were investigated along with the effects on that thermal structure of heat discharges from electric generating plants. Thermoclines develop because of nonlinear interaction between surface turbulence and buoyancy gradients from surface heating. A theoretical model including the interaction of those factors predicts the observed features of stratification accurately. Thermal discharges increase the temperature to a different degree at different levels of the entire lake. Discharges also increase the depth of the thermocline and lengthen the stratification period. An exploratory experimental study is described on the nature of the interfacial mixing between a flowing layer of warm water and an underlying cooler pool of water. (Author)

PB-210 125
Pacific Northwest Water Lab., Corvallis, Oreg.
A METHOD FOR PREDICTING THE PERFORMANCE OF NATURAL DRAFT COOLING TOWERS.

Dec 70, 78p W72-09726, EPA-WQO-16130-GKF-12/70
Paper copy available from GPO $0.75 as stock no. 5501-0122, EP2.10:16130GKF12/70.

Descriptors: (*Cooling towers, Mathematical models), Design criteria, Air flow, Heat transfer coefficient, Mass transfer, Pressure drag, Performance evaluation, Computer programs, Water pollution, Heat.
Identifiers: Natural draft cooling towers, Water pollution control.

A method that does not assume saturated air at the top of the packing is developed for analyzing the performance of counterflow and crossflow natural draft cooling towers. Types of cooling towers and the principles of operation are considered. Simplified differential equations for the heat and mass transfer relations and the methods of integrating them for both counterflow and crossflow towers are given. A large number of integration steps is unnecessary. Equations for estimating the pressure losses in the tower are also given. Simplified flow charts using these integration schemes show how the computer program is used to evaluate tower performance. The computed performance of towers of various heights operating in moist and in dry conditions is shown. The effect of inlet water temperature is significant. The computed performance of a given tower with fixed inlet water temperature is shown as a function of relative humidity and dry bulb air temperature. The computer program and instructions for its use are included. (Author)

PB-210 126
Water Resources Engineers, Inc., Walnut Creek, Calif.
MATHEMATICAL MODELS FOR THE PREDICTION OF THERMAL ENERGY CHANGES IN IMPOUNDMENTS.

Dec 69, 187p W72-09727, EPA-WQO-16130-EXT-12/69
Contract Di-14-12-422
Paper copy available from GPO $1.50 as stock no. EP2.10:16130EXT-12/69.

Descriptors: (*Reservoirs, *Hydraulic models), Mathematical models.

A general objective of the research reported was to devise a generalized mathematical model which would represent, within the practical and reasonable limits of accuracy, the thermal changes which may be expected under alternative hydrologic, hydraulic and climatologic conditions for operating reservoirs.

PB-210 134
Massachusetts Inst. of Tech., Cambridge. Water Resources and Hydrodynamics Lab.
AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF SURFACE DISCHARGES OF HEATED WATER,
K. D. Stolzenbach, and D. R. F. Harleman. Feb 71, 216p W72-09729, EPA-WQO-16130-DJU-02/71
Paper copy availaale from GPO $1.75/copy as EP2.10:16130-DJU-02/71.

Descriptors: (*Water pollution, Heat), (*Stream pollution, Heat), (*Hydraulic models, Temperature distribution), Turbulent flow, Mixing, Plumes, Mathematical models, Theories, Electric power plants, Computer programs.
Identifiers: Thermal pollution.

The prediction of temperature within the region dominated by turbulence from a heated discharge was investigated. A three-dimensional theory is developed, based on a turbulent jet model and including density gradients and surface heat loss. Of interest in formulating the theory is the dependence of the temperature distribution in the receiving water on the temperature difference between discharge and ambient water, the initial discharge velocity, the channel geometry, the bottom slope, the ambient cross flow, and surface heat transfer. Experiments were performed in a laboratory basin in which all of the relevant parameters, including cross flow and bottom slope, are varied and temperatures are measured in the heated discharge. The experiments verify the theoretical predictions.

PB-210 137
Valentine, Fisher and Tomlinson, Seattle, Wash.
ASPHALTIC CONCRETE PLANTS. ATMOSPHERIC EMISSIONS STUDY,
J. A. Crim, and W. D. Snowden. 1 Nov 71, 93p
APTD-0936
Contract EPA-68-02-0076
Available in microfiche only.

Descriptors: (*Air pollution, *Industrial wastes), (*Concrete plants, *Air pollution control equipment), (*Bituminous concretes, Air pollution), Inventories, Gas detectors, Gas sampling, Asphalt, Industrial waste treatment, Flue gases, Scrubbers, Air filters, Particles, Dust control, Concentration (Composition), Design criteria, Cost estimates.
Identifiers: *Air pollution control, Air pollution detection.

The report summarizes previously unpublished emission data on asphaltic concrete plants, shows a comparison between different sampling techniques, and presents guidelines for evaluating the emissions of asphaltic concrete plants. It describes the hot-mix asphalt process, control equipment (Primary and secondary), effects of operational environment upon emissions, emissions, and the cost of control.

PB-210 144
Illinois Inst. of Tech., Chicago. Dept. of Chemical Engineering.
EXPERIMENTAL EVALUATION OF FIBROUS BED COALESCERS FOR SEPARATING OIL-WATER EMULSIONS.
Water pollution control research series.

Nov 71, 99p W72-09580, EPA-12050-DRC-11/71
Paper copy available from GPO $1.75 as EP2.10:12050 DRC 11/71.

Descriptors: (*Oils, *Coalescing), (*Coalescers, Fabrication), Glass fibers, Tests, Performance evaluation, Regeneration (Engineering), Water pollution, Plastic coatings, Design, Operating costs, Cost estimates.
Identifiers: *Oil water separators, *Oil pollution removal.

A laboratory scale oil-water coalescer bed was formed from standard, phenol formaldehyde coated fiber glass, consisting of 3 layers. The bed was then compressed between screens to an overall thickness of 1/4 inch, giving an apparent overall density to the working membrane of 10.8 lb/cu ft. By testing the cell on a synthetic oil dispersion and an actual pollutant stream, a 100% coalescence efficiency at a 7.5 gpm flow rate over the entire run time was established. Stabilization of fibers to mechanical degradation was accomplished by coating the compressed fibers with isobutyl methacrylate resin. This medium, showing the same coalescence efficiency and pressure drop characteristics for the original medium, was regenerable by solvent treatment. Operating costs based on single use of fibers were estimated.

PB-210 145
Colorado Univ., Boulder. Dept. of Chemical Engineering.
EFFECT OF POROUS STRUCTURE ON CARBON ACTIVATION.
Water pollution control research series rept.

Jun 71, 95p W72-09581, EPA-WQO-17020-DDC-06/71
Paper copy available from GPO $1.00 as EP2.10:17020-DDC-06/71.

Descriptors: (*Waste treatment, Adsorbents), (*Activated carbon, *Porosity), (*Coal, Activated carbon), (*Graphite, Activated carbon), Industrial water, Activation, Heat treatment, Air, Carbon dioxide, Area, Microporosity.
Identifiers: Surface area.

Recognizing the potential value of activated carbons for removal of water pollutants, the present study was initiated for the general purpose of obtaining information on the effect of the porous structure of carbon on carbon activation. Reaction rates and porous structures of a calcined Wyoming coal activated by air and by carbon dioxide and a graphite activated by carbon dioxide were measured. Total, macropore and micropore volumes, surface area and pore-size distributions were determined as functions of burnoff. Although pore growth can be described, it cannot yet be predicted.

PB-210 198
National Steel Corp., Weirton, W. Va. Weirton Steel Div.
COMBINED STEEL MILL AND MUNICIPAL WASTEWATERS TREATMENT,
William M. Smith, Houston R. Wood, Gene Current, Goff Ramsey, and Joseph C. Troy. Feb 72, 160p EPA-12010-DTQ-02/72, W72-09825
Paper copy available from GPO $1.50 as EP2.10:12010DTQ02/72.

Descriptors: (*Sewage treatment, *Industrial wastes), (*Iron and steel industry, *Industrial waste treatment), Activated sludge process, Feasibility, Benefit cost analysis, Water pollution, Cost estimates, Economic analysis, Industrial water, Cooling water, Steel plants.
Identifiers: Biological industrial waste treatment, *Water pollution control.

A systems evaluation was made to determine the feasibility and economics of treating selected steel mill and sanitary wastewaters in a municipal sewage treatment plant. The project was Phase I of a three phase program to demonstrate that industries and municipalities through cooperative action can combine their wastewaters and attain their individual treatment goals in an efficient and economical manner. Detailed field work was carried out at the steel plant and the total sewage plant treatment system. Selected steel plant wastes were combined with municipal wastes and evaluated in both batch and continuous treatability bench scale studies. The investigation revealed that that it is technically and economically feasible to co-treat selected steel plant wastes with municipal wastewaters. (Author)

PB-210 199
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
COST TO THE CONSUMER FOR COLLECTION AND TREATMENT OF WASTEWATER.
Water pollution control research series.
Robert Smith, and Richard G. Eilers. Jul 70, 87p
W72-09826, EPA-17090-07/70
Paper copy available from GPO $1.00 as EP2.10:17090-07/70.

Descriptors: (*Sewage treatment, Cost estimates), (*United States, Sewage treatment), Sewers, Sanitary engineering, Capital costs, Operating costs, Economic analysis, Collection.
Identifiers: Per capita costing, Water costs.

The national average per capita cost for collection and treatment of municipal wastewater was computed based on the 1968 Inventory of Municipal Waste Treatment Facilities in the United States and per capita cost relationships for building and operating collection and treatment facilities. All costs are given per capita served with treatment facilities using the level of treatment existing in 1968. The cost of collection is about three times as expensive as treatment. The current status of collection and treatment in the United States is discussed and estimates are made of needed additional expenditure.

PB-210 246
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
STUDIES OF THE FLUIDIZED LIME-BED COAL COMBUSTION DESULFURIZATION SYSTEM. PART 1. DESIGN OF THE HIGH PRESSURE FLUIDIZED BED COMBUSTION LIME REGENERATION PILOT UNIT - THE FBCR MINIPLANT. PART 2. FACTORS AFFECT ING NOX FORMATION AND CONTROL IN FLUIDIZED BED COMBUSTION.
Final rept. 1 Jan-31 Dec 71,
A. Skopp, M. S. Nutkis, G. A. Hammons, and R. R. Bertrand. 31 Dec 71, 126p* GRU.13GFGS.71
APTD-1116
Contract EPA-CPA-70-19

Descriptors: (*Coal, Air pollution), (*Air pollution control equipment, *Fluidized bed processors), (*Air pollution, *Combustion products), (*Desulfurization, Coal), Boilers, Additives, Limestone, High pressure tests, Combustion, Regeneration (Engineering), Calcium oxides, Design, Nitrogen oxides, Sulfur oxides, Reaction kinetics, Carbon monoxide, Adsorbents.
Identifiers: *Air pollution control, Limestone injection, Waste gas recovery.

The preliminary design of 650 KW pressurized (10 atmosphere) fluid bed coal combustor is described. The system will consist of a 12-inch ID combustor and a 5-inch ID regenerator, with provisions for continuous solids circulation between the two reactors. The results of an experimental study conducted with the objective of determining methods of simultaneously obtaining low SO (x) and NO (x) emissions from a fluidized bed coal combustor are reported. In fixed bed reactor studies, a reaction system involving NO, SO2, and CaO was identified. The apparent order of this reaction was about 0.5 and it had a negative temperature dependence. The reduction of NO by CO over CaSO4 was also studied in fixed bed experiments and found to proceed at appreciable rates in the 1300 F to 1700 F.

PB-210 256
West Virginia Univ., Morgantown. Engineering Experiment Station.
EXPERIMENTAL INVESTIGATION OF THE PENETRATION AND DISPERSION PHENOMENA IN THE LIMESTONE INJECTION METHOD.
Final rept. 30 Jun 69-29 Apr 71,
S. H. Schwartz, and R. N. Salzman. Apr 71, 210p
APTD-1134
Contract CPA-22-69-149

Descriptors: (*Furnaces, Injection), (*Air pollution, *Sulfur dioxide), Additives, Limestone, Mathematical models, Boilers, Despersing, Concentration (Composition), Flow rates, Turbulent flow, Simulation, Mixing.
Identifiers: *Limestone injection, *Air pollution control.

The research was to model the geometry and flow conditions of the Shawnee Unit 10 Boiler during the dry limestone injection process. The basic goal was to determine the penetration and dispersion characteristics of the limestone injection. A cold-gas model was selected with a geometric scale factor of 12.5 to 1. The combustion gases and the solid-gas injection flow conditions in the boiler were simulated by keeping the values of the relevant dimensionless parameters for the model as close as possible to those of the full scale Shawnee unit. The degree of dispersion of the limestone was characterized by a percent coverage value which in effect is the fraction of complete mixing of the limestone and SO2. Percent coverage values were calculated for the Shawnee boiler for each of the three injection levels. The same was done for the model at one turbulence level and then additional tests were conducted at a fixed injection level under various turbulence conditions.

PB-210 266
Dynasciences Corp., Chatsworth, Calif. Instrument Systems Div.
DEVELOPMENT OF A FORMALDEHYDE ANALYZER FOR MOTOR VEHICLE EXHAUST EMISSIONS.
Final rept. 1 Jul 70-30 Jun 71,
Timothy H. Johnston, Roland V. Marcote, and Ramesh Chand. 30 Aug 71, 106p* 171 APTD-0955
Contract CPA-70-170

Descriptors: (*Aldehydes, *Gas detectors), (*Air pollution, Gas detectors), (*Exhaust gases, Gas detectors), Electrochemical cells, Formaldehyde, Quantitative analysis, Membranes, Electrodes, Design, Engineering drawings, Calibration, Microanalysis, Transducers, Diffusion.
Identifiers: *Air pollution detection, *Automobile exhaust, Polymer gas permeability.

The purpose was to develop an electrochemical transducer which would selectively oxidize formaldehyde in the midst of all of the other gas species present in the exhaust stream of internal combustion engines. The current generated by this device would be amplified and displayed in a manner which would permit quantitative analysis of the formaldehyde concentration. The sensor which was developed was not as selective as proposed. However, its lack of selectivity applies only to members of the aldehyde family. It is equally sensitive to all aldehydes. The problem of evaluating the sensor's performance necessitated the completion of two other significant achievements: production of a reliable formaldehyde standard in the 1ppm concentration range; and development of a wet method of analysis which would give accurate yet fairly rapid measurements at this low level of pollutant.

PB-210 324
Connecticut Univ., Storrs. Biological Sciences Group.
A MICROBIOLOGICAL SURVEY IN LAKE ERIE NEAR CLEVELAND, OHIO.
Water pollution control research series,
Ralph P. Collins. Oct 71, 30p W72-10076, EPA-16020-GDQ-10/71
Paper copy available from GPO $0.50 as EP2.10:16020 GDQ 10/71.

Descriptors: (*Water supply, *Odors), (*Microorganisms, Odors), (*Taste, Water supply), Fungi, Bacteria, Algae, Ohio, Great Lakes, Phytoplankton, Sampling.
Identifiers: *Lake Erie, Cleveland (Ohio).

Periodic taste and odor at the Cleveland, Ohio Crown Water Treatment Plant prompted investigation of the role microorganisms play in the problem. Fungi, bacteria, and algae collected near the plant intake were studied during June through August 1971. During the three months of sampling, no vertical distribution pattern was noted in quantitative analysis of the phytoplankton. A number of algae, reported to induce taste and odor in water, were identified. Whatever the source of these odors, they were not due to benthic or periphyton algae, but could have been associated with the phytoplankton community as the reported 'Lake Erie odor' coincided with phytoplankton increase.

PB-210 372
Mitre Corp., McLean, Va.
AN EXAMINATION OF ALKALI INJECTION - WET SCRUBBER PROCESS DEMONSTRATION PROJECTS,
L. Hoffman, and K. E. Yeager. Nov 70, 25p MTR-1494 APTD-0843
Contract F19628-68-C-0365

Descriptors: (*Air pollution control equipment, *Scrubbers), (*Air pollution, *Sulfur dioxide), (*Electric power plants, Air pollution control equipment), Field tests, Performance evaluation, Design criteria, Combustion products, Flue gases, Cost estimates, Operating costs, Capital costs, Corrosion.
Identifiers: Limestone scrubbing, *Alkaline scrubbing, *Air pollution control.

The operating experiences of two electric utility plants with prototype alkali injection - wet scrubbers installations of an SO2 removal process are discussed. Design considerations relating to deposits, corrosion, and reliability are also discussed.

PB-210 373
Mitre Corp., McLean, Va.
THE PHYSICAL DESULFURIZATION OF COAL-MAJOR CONSIDERATIONS OF SO2 EMISSION CONTROL,
L. Hoffman, and K. E. Yeager. Nov 70, 322p MTR-4151 APTD-0844
Contract F19628-68-C-0365

Descriptors: (*Desulfurization, Coal preparation), (*Economic factors, *Coal preparation), (*Air pollution, *Sulfur dioxide), Cost estimates, Benefit cost analysis, Abatement, Coal deposits, Capital costs, Operating costs, Taxes, Sources, Sulfur, Concentration (Composition).
Identifiers: *Air pollution economics, *Air pollution abatement, Low sulfur fuels.

The major economic factors which will affect the application of coal physically cleaned to 1% total sulfur content as an SO2 emission control method for stationary power sources were examined. The individual cost factors associated with producing physically desulfurized coal and the economic benefit factors associated with the use of this coal were defined and quantified. Thirty potential physically desulfurized coal source/user combinations were analyzed to indicate the range of economic system variability to be expected. (Author)

PB-210 381
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XII. TECHNICAL PAPERS FROM THE LENINGRAD INTERNATIONAL SYMPOSIUM ON THE METEOROLOGICAL ASPECTS OF ATMOSPHERIC POLLUTION. PART 1,
M. Y. Nuttonson. Jan 72, 139p AICE-AIR-72-12 APTD-1117
See also Volume 11, PB-209 478.

Descriptors: (*Air pollution, *Atmospheric diffusion), (*USSR, Air pollution), Meetings, Electric power plants, Plumes, Concentration (Composition), Atmospheric composition, Smoke, Turbulent diffusion.
Identifiers: Air pollution forecasts.

Twelve papers dealing with the meteorological aspects of air pollution were translated. These papers were initially presented at an international symposium held in Leningrad during July 1968. The papers are: Status and prospective development of meteorological studies of atmospheric pollution; Effect of the stability of the atmosphere on the dissemination of gaseous pollutants; Method of determination of average impurity concentration near an electric power plant by means of an electronic computer; Methods of calculation of the surface concentration of a gaseous impurity discharged from an elevated source; Results of experimental study of smoke plumes from thermal power plants; Atmospheric diffusion and structure of the air flow above a nonuniform underlying surface; Procedure for calculating the pollution of the atmosphere with discharges of industrial plants and thermal power plants; Statistical forecasting average atmospheric pollution; Method of calculating the degree of atmospheric pollution; On the determination of diffusion parameters for actual locations; Turbulence in the lower 500 M layer and diffusion of impurities; and, Atmospheric turbulence at small heights.

PB-210 382
Little (Arthur D.), Inc., Cambridge, Mass.
INCINERATOR OVERFIRE MIXING STUDY,
C. Michael Mohr, and Adel F. Sarofim. Feb 72, 242p* ADL-72940 APTD-1133
Contract EPA-EHSD-71-6

Descriptors: (*Combustion, Incinerators), (*Incinerators, Air pollution), (*Air pollution, Combustion products), (*Refuse disposal, Air pollution), Carbon monoxide, Oxidation, Design criteria, Mixing, Baffles, Mathematical models, Gas flow, Jet mixing flow, Bibliographies.
Identifiers: *Air pollution control, *Solid waste disposal, Overfire mixing.

The processes occurring in a burning refuse bed are analyzed to yield estimates for the rate and quantity of combustibles emitted from the bed. Gases of over 14% carbon monoxide content can be released. Methods are then developed to analyze the flow through the furnace. The analysis shows that stratification of the flow and incomplete mixing of fuel and sufficient oxygen-containing gases can occur. Design equations are presented describing the behavior of overfire air or steam jets for mixing, tempering and/or bringing oxygen to the combustible gases. Refuse incinerator overfire air system design methods developed from the above analyses are presented and contrasted with similar design methods for solid fuel bed coal-firing furnaces. (Author)

PB-210 406
Oregon State Univ., Corvallis. School of Engineering.
AIRPHOTO ANALYSIS OF OCEAN OUTFALL DISPERSION.
Water pollution control research series,
Fred J. Burgess, and Wesley P. James. Jun 71, 292p W72-10146, EPA-16070-ENS-06/71
Paper copy available from GPO $2.25 as EP2.10:16060 ENS 06/71.

Descriptors: (*Outfall sewers, *Plumes), (*Oceans, Outfall sewers), (*Remote sensing, *Water pollution), Aerial photography, Dyes, Dispersing, Ocean currents, Wind velocity, Photogrammetry, Computer programs, Waste disposal.
Identifiers: *Water pollution detection, Liquid waste disposal, *Ocean waste disposal.

The objective of the research was to develop a remote sensing tool for the evaluation of dispersion of wastes from existing or proposed ocean outfalls. Photogrammetric and photo interpreta-

tion methods were used to determine dispersion patterns, diffusion coefficients, waste concentrations and nearshore currents. The study is unique in that the aerial photography is not only used to determine the position of points and the size of objects as in normal photogrammetry, but the photograph is also used as an energy sensor. Procedures were developed using dye drops from an airplane. The water current velocity was found to be the dominant factor in the resulting plume pattern. Characteristic airphoto pattern elements are given for visual interpretation of the photography.

PB-210 407
Winter Garden Citrus Products Cooperative, Fla.
COMPLETE MIX ACTIVATED SLUDGE TREATMENT OF CITRUS PROCESS WASTES.
Water pollution control research series.

Aug 71, 123p W72-10223, EPA-12060-EZY-08/71
Paper copy available from GPO $1.25 as EP2.10: 12060 EZY 08/71.

Descriptors: (*Food processing, *Industrial waste treatment), (*Citrus fruits, Food processing), Activated sludge process, Aeration, Calcium oxides, Nutrients, Nitrogen, Phosphorus, Cost estimates, Capital costs, Operating costs, Sludge digestion.
Identifiers: *Citrus fruit processing, *Water pollution control, Biological industrial waste treatment.

A full-scale, complete mixed activated sludge treatment system effectively treats concentrated citrus process wastes. This process has a BOD reduction capability of 99 percent; but it produces 0.5 to 0.6 pounds of waste sludge per pound of influent BOD. The efficiency was reduced by periodic foaming and solids carryover in the effluent caused by the unscheduled discharge of orange oil and peel press liquor to the treatment plant. Controlling the addition of nitrogen and phosphorus to the influent of the nutrient deficient wastewater effectively controlled effluent nitrogen and phosphorus concentrations. Waste sludge was mixed with citrus peel and processed as a cattle feed additive in the existing facilities. The waste activated sludge represented approximately 1.5 percent of the total cattle feed production on a dry weight basis. Treatment plant effluent was reused for barometric leg and cooling water and was then discharged. (Author) Costs are presented.

PB-210 408
Quirk, Lawler and Matusky Engineers, New York.
WHEY EFFLUENT PACKED TOWER TRICKLING FILTRATION.
Water pollution control research series.

Sep 71, 186p W72-10226, EPA-12130-DUJ-09/71
Paper copy available from GPO $1.50 as EP2.10: 12130 DUJ 09/71.

Descriptors: (*Food processing, *Industrial waste treatment), (*Dairy products, Food processing), Sewage treatment, Trickling filtration Activated sludge process, Mathematical models, Computer programming, Process variables, Cost estimates, Operating costs, Capital costs.
Identifiers: *Whey, *Water pollution control, Biological industrial waste treatment.

Waste waters containing whey from the manufacture of cheese are notorious for causing waste treatment problems, whether treated alone or in conjunction with other wastes including domestic sewage. The purpose of the project was the development of activated sludge and biological filtration processes applicable to the treatment of whey-bearing wastes. The scope included the determination of mathematical models of process performance, the preparation of computer programs for process design, and the evaluation of methods for dewatering secondary sludges.

PB-210 409
Environmetrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: AN OVERVIEW.
Water pollution control research series.

Dec 71, 113p W72-10307, EPA-16110-FRU-12/71-1
Paper copy available from GPO $1.00 as EP2.10: 16110 FRU 12/71-1.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), Water resources, Mathematical models, Computer programming, Water pollution, Land use, Models.
Identifiers: *Water pollution abatement.

The River Basin Model which is a man-machine simulation model, used primarily to replicate the interactions taking place, within a real or hypothetical area, between the local water system and the full range of economic, social, and governmental activities of that area. It is a water resource model representing supply of, demand for, and quality of water, but it is also a labor market model, a land use and assessment model, and several more; it is a model of an entire regional system with water a subsystem realistically interacting with all the other major subsystems; the output from the operating programs of the computer package illustrate the impact that the water system has on such phenomena as housing selection, employment, and government budgetary activity. Model users are given control over all the resources of the local area being represented.

PB-210 410
Environmetrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: UTILITY DEPARTMENT.
Water pollution control research series.

Dec 71, 135p W72-10313, EPA-16110-FRU-12/71-9
Paper copy available from GPO $1.25 as EP2.10: 16110 FRU 12/71-9.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), (*Public utilities, Water pollution), Water services, Sewage treatment, Water resources, Mathematical models, Government policies, Management planning, Models, Water treatment.
Identifiers: Water pollution abatement.

The River Basin Model replicates interactions taking place between the local water system and the full range of regional activities within a real or hypothetical area. It is a man-machine simulation model using a gaming format; it is a model of an entire regional system with water a subsystem realistically interacting with the other major subsystems. The model is a computer assisted decision-making tool providing programs to which its users present inputs on behalf of business activities in the Economic Sector, groups of people or population units in the Social Sector, and government departments in the Governmental Sector. The Governmental Sector and the model required by its Utility Department are described.

PB-210 411
Environmetrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: HIGHWAY DEPARTMENT.
Water pollution control research series.

Dec 71, 110p W72-10314, EPA-16110-FRU-12/71-10
Paper copy available from GPO $1.00 as EP2.10: 16110 FRU 12/71-10.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), (*Highway planning, River basin development), Water resources, Local government, Mathematical models, Computer programming, Gaming models, Government policies, Management planning.
Identifiers: Water pollution abatement.

The River Basin Model is not primarily a water management model. Through human interaction and computer simulation, it and its users represent the major economic, social, and governmental decision-making which causes a regional system to function and change on a year-to-year basis. As part of the functioning of this system, water is demanded by industries and municipal water suppliers and pollution is generated by manufacturing and commercial activities, by people, and by farm activities. A gaming format is employed; model users provide inputs to the computer programs on behalf of business activities in the Economic Sector, groups of people or population units in the Social Sector, and government departments in the Governmental Sector. The Governmental Sector and the model required by its Highway Department are described.

PB-210 465
Arizona Univ., Tucson. Dept. of Microbiology and Medical Technology.
MECHANISMS OF BIOLOGICAL LUXURY PHOSPHATE UPTAKE.

Nov 71, 84p W72-10224, EPA-17010-DDQ-11/71
Paper copy available from GPO $1.00 as EP2.10: 17010 DDQ 11/71.

Descriptors: (*Activated sludge process, Phosphorus), (*Phosphorus, *Chemical removal (Sewage treatment)), (*Sewage treatment, Activated sludge process), Microbiology, Bacteria, Labeled substances, Phosphates, Process variables, Metabolism.
Identifiers: Zoogloea ramigera.

A number of sewage plants throughout the country have reported sludges that have high phosphorus affinities and remove this element rapidly and completely when it occurs in their natural waste waters. The mechanisms by which high affinity sludges remove phosphorus have not been fully elucidated. Thus the authors hoped to elucidate the means by which these sludges worked.

PB-210 564
National Air Pollution Control Administration, Durham, N.C. Air Quality and Emission Data Program.
STATE OF HAWAII AIR POLLUTANT EMISSION INVENTORY,
Clyde B. Morita. Jan 70, 71p APTD-0817

Descriptors: (*Air pollution, *Hawaii), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Seasonal variations, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Evaporation, Waste disposal, Demography.
Identifiers: *Air quality data, *Implementation Air Pollution Planning Program.

The sources and emissions of air pollutants for Hawaii are outlined. Estimates are provided of total emissions of oxides of sulfur, oxides of nitrogen, hydrocarbons, carbon monoxide and particulate matter. The emissions of these pollutants are delineated with respect to source type, season of the year, and by their geographical distribution within the area. The current level of emissions and status of their control was also determined. The general procedure for these surveys is based on the rapid survey technique. Emissions for the most part are estimated using various indicators of pollutant emissions and average emission factors that are related to these. (Author)

PB-210 583
Washington State Univ., Pullman. Coll. of Engineering.
INVESTIGATION OF EMISSIONS FROM PLYWOOD VENEER DRYERS.
Revised final rept.

Feb 72, 141p APTD-1144
Contract CPA-70-138

Descriptors: (*Air pollution, *Hydrocarbons), (*Wood products, Air pollution), (*Plywood, *Drying), Veneers, Industrial wastes, Concentration (Composition), Quantitative analysis, Gas chromatography, Gas analysis, Thin layer chromatography, Particles, Terpene hydrocarbons.

The emissions from thirteen plywood dryers drying ten different specie types were studied. The objectives of the study included the determination of the physical and chemical nature of the emissions from these dryers during the drying of various veneer species under normal conditions of operation and the evaluation of process differences which might account for the observed differences in visual emissions. Determinations were made of the volatile and condensable hydrocarbon emissions. Visual observations of the equivalent opacity of the stack emissions were also made. Process and materials variables were documented to attempt to determine causes for the variations in hydrocarbon emissions.

PB-210 586
National Canners Association, Berkeley, Calif. Western Research Lab.
TRICKLING FILTER TREATMENT OF FRUIT PROCESSING WASTE WATERS.
Sep 71, 44p W72-10412, EPA-12060-EAE-09/71
Paper copy available from GPO $0.50 as EP2.10: 12060 EAE 09/71.

Descriptors: (*Trickling filters, Industrial waste treatment), (*Industrial waste treatment, *Food processing), (*Fruits, Food processing), Aerobic processes, Performance evaluation, Canneries, Design, Process variables.
Identifiers: *Fruit processing, *Water pollution control, Biological industrial waste treatment.

The purpose of the project was to evaluate and compare the performance of two high rate trickling filter systems in reducing the pollutional capacity of liquid wastes from fruit canning operations. The scope of the project included locating the units at a cannery and modifying them for operation on fruit processing waste water. Modifications included the updating of schematic drawings, installation of insulation material, procurement of a heating system, procurement of a nutrient feed system, and replacement of the packing medium in one of the filters. (Author)

PB-210 651
Tyco Labs., Inc., Waltham, Mass.
DEVELOPMENT OF THE CATALYTIC CHAMBER PROCESS.
Final rept. 23 Apr-22 Oct 70,
A. Gruber, and A. Walitt. Oct 70, 155p* APTD-1156
Contract CPA-70-59
See also report dated 30 Sep 69, PB-209 191.

Descriptors: (*Air pollution control equipment, *Combustion products), (*Air pollution, Combustion products), (*Sulfur dioxide, Air pollution control equipment), (*Nitrogen oxides, Air pollution control equipment), Activated carbon, Oxidation reduction reactions, Catalysis, Electric power plants, Sulfur trioxide, Nitrogen dioxide, Feasibility, Design criteria, Sulfuric acid, Nitric acid, Scrubbers, Strippers, Catalysts.
Identifiers: *Air pollution control, *Waste gas recovery, *Catalytic chamber process, *TYCO process.

The Catalytic Chamber Process is aimed at solving one of our most pressing air pollution problems: the emission of enormous quantities of sulfur dioxide and nitrogen oxides into the atmosphere from the stacks of power plants burning fossil fuels. The process features the oxidation of SO2 to SO3 through the use of nitrogen dioxide as a homogenous, gas-phase, reactive catalyst in a manner similar to the old Lead Chamber Process. The objective was to: Confirm the technical feasibility of the Catalytic Chamber Process, and Obtain preliminary engineering design data necessary for process scale-up. A laboratory-scale investigation was made of the separate process stages and of an integrated 10 SCFM unit. Three major modifications were investigated. The sulfur dioxide oxidation and the nitric oxide oxidation were performed in separate stages; A high temperature scrubber was used; and A catalytic stripper was used to simultaneously remove the oxides of nitrogen from the scrubbing acid and oxidize them to nitrogen dioxide.

PB-210 670
Gordian Associates, Inc., New York.
GUIDE TO TECHNICAL AND FINANCIAL ASSISTANCE FOR AIR POLLUTION CONTROL.

Nov 71, 147p* APTD-1119
Contract EPA-68-02-0331

Descriptors: (*Air pollution, *Taxes), (*Air pollution control equipment, Taxes), Government policies, State government, Federal government, Financing, Laws (Jurisprudence), Industries.
Identifiers: *Tax incentives, Air pollution economics, Air pollution control.

The Federal, state and other technical and financial assistance sources which business and industry can use in complying with their abatement obligations are described. Tax law provisions, sources of low cost financing and special aid, eligibility requirements, application procedures, review and appeal procedures, and sources of technical aid and supplementary information are also discussed. The tax incentives discussed are specifically for devices which control air pollution. (Author)

PB-210 671
General Electric Co., Syracuse, N. Y. Electronics Lab.
FIELD STUDY ON APPLICATION OF LASER COINCIDENCE ABSORPTION MEASUREMENT TECHNIQUES.
Final rept.

Feb 72, 75p* APTD-0981
Contract EPA-EHSD-71-8

Descriptors: (*Air pollution, *Infrared detection), (*Gas detectors, Infrared detection), (*Ethylene, Gas detectors), (*Ammonia, Gas detectors), Field tests, Performance evaluation, Carbon dioxide lasers, Infrared lasers, Absorption spectra, Errors, Electromagnetic interference, Design, Transmittance, Remote sensing.
Identifiers: *Air pollution detection, Laser spectroscopy.

The purpose of the research was to conduct a field study on the merits and limitations of laser coincidence absorption measurement technique applied to long-path monitoring of a gaseous pollutant in an urban atmosphere. Two gaseous pollutants, ethylene and ammonia, were selected and spectral interferences identified. Using a spectrally tunable CO2 laser, measurements and system evaluation were conducted. Selected pollutant concentrations and spectral interference effects were recorded. Concurrent point measurements were made by gas chromatograph for ethylene concentrations. Overall system effectiveness and test results were analyzed and performance evaluated.

PB-210 672
General Electric Co., Philadelphia, Pa. Space Div.
DESIGN CONSTRUCTION AND EVALUATION OF A MOBILE LIDAR SYSTEM FOR THE REMOTE MEASUREMENT OF SMOKE PLUME OPACITY.
Final rept. 24 Dec 69-21 Dec 71,
C. S. Cook, and G. W. Bethke. Dec 71, 100p* APTD-0968
Contract EPA-68-02-0093

Descriptors: (*Air pollution, *Optical radar), (*Detectors, Optical radar), (*Particles, Detectors), (*Smoke, Detectors), Design, Mobile equipment, Transmittance, Light scattering, Back scattering, Monitors, Optics, Reflectance, Field tests, Plume detection, Visibility, Ruby lasers, Performance evaluation, Errors, Remote sensing.
Identifiers: *Air pollution detection.

A mobile (truck mounted) ruby laser lidar system has been designed, constructed and evaluated for the remote measurement of smoke plume opacity (or transmittance). The system has been tested at ranges of 211 and 319 meters using synthetic targets of known laboratory measured transmittance. The targets used were made of bright and black anodized aluminum screen, glass, plexiglass, white painted plywood and black felt. These tests indicated an error which increased as target reflectance increased. In general, the lidar and telephotometer determined transmittance values agreed within the accuracy expected for a given plume transmittance as indicated by the synthetic target test results. Plume-to-sky contrast (plume visibility) was found to have no correlation with plume transmittance because of the variability of ambient illumination of the plume.

PB-210 676
Davis (W. E.) and Associates, Leawood, Kans.
NATIONAL INVENTORY OF SOURCES AND EMISSIONS. BARIUM, BORON, COPPER, SELENIUM, AND ZINC 1969 - BARIUM SECTION I,
W. E. Davis. May 72, 56p* APTD-1140
Contract EPA-68-02-0100
See also Section 2, PB-210 677.

Descriptors: (*Air pollution, *Barium), (*Metals, Air pollution), Industrial wastes, Metal industry, Barite, Combustion products, Coal, Trace elements, Tires, Chemical industry, Sources, Inventories, Iron and steel industry, Fuel oil, Mining.
Identifiers: Barium industry.

Information is provided regarding the nature, magnitude, and extent of the emissions of barium in the United States for the year 1969. Background information concerning the basic characteristics of the barium (barite) industry has been assembled and included. Brief process descriptions are given; they are limited to the areas that are closely related to existing or potential atmospheric losses of the pollutant. Emissions to the atmosphere during the year were 15,420 tons. Nearly 18 percent of the emissions resulted from the processing of barite, more than 28 percent from the production of chemicals, 23 percent from the manufacture of various end products, and about 26 percent from the combustion of coal. The wear of rubber tires was a relatively minor emission source.

PB-210 677
Davis (W. E.) and Associates, Leakwood, Kans.
NATIONAL INVENTORY OF SOURCES AND EMISSIONS. BARIUM, BORON, COPPER, SELENIUM, AND ZINC 1969. BORON, SECTION II,
W. E. Davis. Jun 72, 51p APTD-1159
Contract EPA-68-02-0100
See also Section 1, PB-210 676 and Section 3, PB-210 678.

Descriptors: (*Air pollution, *Boron), (*Metals, Air pollution), Inventories, Sources, Coal, Fuel oil, Combustion, Sewage disposal, Industrial wastes, Metal industry, Trace elements, Chemical industry, Mining.
Identifiers: Boron industry.

Information is provided regarding the nature, magnitude, and extent of the emissions of boron. Background information concerning the basic

characteristics of the boron industry has been assembled and included. Process descriptions are given, but they are brief, and are limited to the areas that are closely related to existing or potential atmospheric losses of the pollutant. Emissions to the atmosphere during the year were 11,003 tons. Nearly 22 percent of the emissions resulted from the processing of boron compounds, more than 34 percent from the manufacture and use of various end products, and about 43 percent from the combustion of coal. Emission estimates for processing and the manufacture of end use products are based on unpublished data obtained from industrial sources.

PB-210 678
Davis (W. E.) and Associates, Leawood, Kans.
NATIONAL INVENTORY OF SOURCES AND EMISSIONS BARIUM, BORON, COPPER, SELENIUM, AND ZINC 1969 - COPPER SECTION III,
W. E. Davis. Apr 72, 74p APTD-1129
Contract EPA-68-02-0100
See also Section 2, PB-210 677, and Section 4, PB-210 679.

Descriptors: (*Air pollution, *Copper), (*Metals, Air pollution), Inventories, Sources, Coal, Fuel oil, Combustion, Trace elements, Metal industry, Waste disposal, Incinerators, Industrial wastes, Metal scrap, Mining.
Identifiers: Copper industry.

Information is provided regarding the nature, magnitude, and the extent of the emissions of copper in the United States for the year 1969. Background information concerning the basic characteristics of the copper industry has been assembled and included. Brief process descriptions are given; they are limited to the areas that are closely related to existing or potential atmospheric losses of the pollutant. Emissions to the atmosphere during the year were 13,680 tons. About 64 percent of the emissions resulted from the metallurgical processing of primary copper, and about 20 percent from the production of iron and steel. The combustion of coal was the only other significant emission source.

PB-210 679
Davis (W. E.) and Associates, Leawood, Kans.
NATIONAL INVENTORY AND SOURCES AND EMISSIONS BARIUM, BORON, COPPER, SELENIUM, AND ZINC 1969 - SELENIUM SECTION IV,
W. E. Davis. Apr 72, 57p APTD-1130
Contract EPA-68-02-0100
See also Section 3, PB-210 678 and Section 5, PB-210 680.

Descriptors: (*Air pollution, *Selenium), (*Metals, Air pollution), Inventories, Sources, Mining, Copper, Metal industry, Chemical industry, Coal, Fuel oil, Combustion, Incinerators, Waste disposal.
Identifiers: Selenium industry.

Information is provided regarding the nature, magnitude, and extent of the emissions of selenium in the United States for the year 1969. Background information concerning the basic characteristics of the selenium industry has been assembled and included. Brief descriptions are given; they are limited to the areas that are closely related to existing or potential atmospheric losses of the pollutant. Emissions to the atmosphere during the year were 986 tons. The emissions that resulted from the combustion of coal were about 65 percent of total emissions, and those due to the manufacture of glass were nearly 21 percent. Emissions from metallurgical processing of nonferrous metals and the burning of fuel oil were 9 percent and 7 percent respectively, while all other emissions were less than one percent of the total.

PB-210 680
Davis (W. E.) and Associates, Leawood, Kans.
NATIONAL INVENTORY OF SOURCES AND EMISSIONS BARIUM, BORON, COPPER, SELENIUM AND ZINC 1969 - ZINC SECTION V,
W. E. Davis. May 72, 85p* APTD-1139
Contract EPA-68-02-0100
See also Section 4, PB-210 679.

Descriptors: (*Air pollution, *Zinc), (*Metals, Air pollution), Inventories, Sources, Mining, Metal scrap, Zinc coatings, Zinc oxides, Chemical industry, Metal industry, Coal, Fuel oil, Combustion, Iron and steel industry, Incinerators, Waste disposal.
Identifiers: Zinc industry.

Information is provided regarding the nature, magnitude, and extent of the emissions of zinc in the United States for the year 1969. Background information concerning the basic characteristics of the zinc industry has been assembeled and included. Brief process descriptions are given; they are limited to the areas that are closely related to existing or potential atmospheric losses of the pollutant. Emissions to the atmosphere during the year were 159,922 tons. About 31 percent of the emissions resulted from the metallurgical processing of zinc, more than 30 percent from the production of iron and steel, and nearly 18 percent from the incineration of refuse. The production of zinc oxide, the wear of rubber tires, and the combustion of coal were also significant emmission sources.

PB-210 701
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
TEMPERATURE PREDICTION IN STRATIFIED WATER: MATHEMATICAL MODEL-USER'S MANUAL.
Water Pollution control research series.

Apr 71, 134p W72-10547, EPA-16130-DJH-04/71
Paper copy available from GPO $1.25 as EP2.10:16130DJH04/71.

Descriptors: (*Lakes, Temperature distribution), (*Reservoirs, Temperature distribution), (*Water quality, Research), Mathematical prediction, Thermal stresses, Mathematical models, Computer programs, Convection, Temperature gradients, Stratification, Water pollution, North Carolina.
Identifiers: Thermal stratification, *Fontana Reservoir.

Predictions of the complex annual cycle of temperature changes in a lake or reservoir are necessary if proper water quality control is to be achieved. Many lakes and reservoirs exhibit horizontal homogeneity and thus a time-dependent, one-dimensional model describing the temperature variation in the vertical direction is adequate. A discretized mathematical model was developed based on the absorption and transmission of solar radiation, convection due to surface cooling and advection due to inflows and outflows. The model contains provision for simultaneous or intermittent withdrawal from multi-level outlets and time of travel for inflows within the reservoir. (Author)

PB-210 702
EG and G Inc., Boulder, Colo. Environmental Services Operation.
POTENTIAL ENVIRONMENTAL MODIFICATIONS PRODUCED BY LARGE EVAPORATIVE COOLING TOWERS.
Water pollution control research series.

Jan 71, 80p W72-10548, EPA-16130-DNH-01/71
Contract FWPCA-14-12-542
Paper copy available from GPO $0.75 as EP2.10:16130DNH01/71.

Descriptors: (*Cooling towers, *Plumes), (*Air pollution, Heat), Water vapor, Fog, Humidity, Mathematical models, Computer programs, Atmospheric diffusion, Cloud physics, Topography, Cloud seeding, Site surveys.
Identifiers: *Thermal pollution.

A readily usable model was developed for evaluating the extent of plumes from large evaporative cooling towers. Mathematical models were used to describe the dynamics of the wet cooling tower plume and its interaction with the environment. Primary emphasis was placed on predicting the height of the plume. Classical atmosphere diffusion theory was used to determine the downwind spread. The saturation deficit of the atmosphere controls the downwind spread of and fogging used by the plume. A map of the U.S. indicating locations of potential adverse atmospheric effects due to cooling towers can be used in conjunction with local data. Appendix contains a description of the computer program, including input specifications.

PB-210 703
Envirometrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: COMPUTER OUTPUT.
Water pollution control research series.

Dec 71, 251p W72-10574, EPA 16110-FRU-12/71-12
Contract FWPCA-14-12-959
See also PB-210 409.
Paper copy available from GPO $2.00 as EP2.10:16110FRU12/71-12.

Descriptors: (*River basin development, Decision making), (*Regional planning, River basin development), (*Water resources, River basin development), Computerized simulation, Computer programming, Interactions, Mathematical models, Decision making, Land use, Economic analysis, Socioeconomic status, Government policies, Maps, Gaming models, Water quality.
Identifiers: *Water pollution abatement, River Basin Model.

The River Basin Model is a man-machine simulation model used to delineate the interactions taking place, within a real or hypothetical area, between the local water system and the economic, social, and governmental activities of that area; it is a model of an entire regional system, with water a subsystem realistically interacting with all the other major subsystems, such as transportation and housing. A gaming format is employed, and Model users provide inputs to the computer programs which simulate the major processes. The functions of the computer are presented, and the computer printed output is described in detail. The computer stores and updates all relevant statistics for the area, simulates the actions of the outside systems (such as a national business cycle), and performs certain routine, otherwise time-consuming processes (such as calculating a comprehensive water quality index). (Author)

PB-210 704
Michigan State Univ., East Lansing.
THE EFFECTS OF ARTIFICIAL AERATION ON LAKE ECOLOGY.
Water pollution control research series,
Arlo Wade Fast. Dec 71, 494p W72-10605, EPA-16010-EXE-12/71
Paper copy available from GPO $4.25 as EP2.10:16010EXE12/71.

Descriptors: (*Aeration, Water pollution), (*Lakes, Ecology), Limnology, Benthos, Zooplankton, Fishes, Dipthers, Stratification, Dissolved gases, Oxygen, Primary biological production, Aquatic animals, Mixing, Water chemistry, Michigan.
Identifiers: *Eutrophication, *Water pollution control, Midges, Winterkilling.

Two Michigan lakes, eutrophic Lake Hemlock and oligotrophic Section Four Lake, were artificially aerated by compressed air from mid-June to September. Only the hypolimnion of the eutrophic

lake was aerated which resulted in increased oxygen concentration from 0.1 mg/l to over 10.0 mg/l while thermal stratification was maintained. Zooplankton, zoobenthos, and fish distributed throughout the lake after aeration. Midges emerged from the deepest point. Aeration apparently reduced nutrient anaerobic regeneration but increased nutrient regeneration through aerobic decomposition of profundal sediments. Artificial destratification of the oligotrophic lake greatly increased the minimum temperature budget. No appreciable winterkill occurred and many trout overwintered without any known ill effects.

PB-210 705
Colorado State Univ., Fort Collins. Dept. of Zoology.
DISSOLVED AND PARTICULATE ORGANIC CARBON IN SOME COLORADO WATERS.
Water pollution control research series,
Edward B. Reed. Oct 71, 84p W72-10606, EPA-16010-EQA-10/71
Paper copy available from GPO $1.00 as EP2.10:16010EQA10/71.

Descriptors: (*Water analysis, *Carbon), (*Water supply, Carbon), (*Colorado, Water supply), Particles, Organic compounds, Sampling, Limnology, Rivers, Lakes, Water pollution, Bacteria.
Identifiers: *Organic carbon.

Instantaneous amounts of organic carbon, both particulate and dissolved, in a number of freshwaters ranging from unproductive tarns to moderately productive reservoirs were measured by acid-persulfate digestion and infrared absorption. Organic carbon was designated as net seston carbon, filter seston carbon, or dissolved carbon based on filtering techniques. Repeated sampling showed amounts of organic carbon, either dissolved or particulate, fluctuated considerably over short periods of time; the dissolved fraction probably varying less than particulate forms. Almost daily measurements in samples incubated over three week periods also revealed erratic changes, with no clear reduction in total organic carbon. The data have descriptive value, although they cannot, at this time, be related satisfactorily to the general limnological knowledge.

PB-210 707
Wisconsin Univ., Madison. Water Resources Center.
NUTRIENT SOURCES FOR ALGAE AND THEIR CONTROL.
Water pollution control research series,
George P. Fitzgerald. Aug 71, 85p W72-10608, EPA-16010-ENR-08/71
Paper copy available from GPO $1.00 as EP2.10:16010EHR08/71.

Descriptors: (*Indicator species, *Nutrients), (*Water pollution, Nutrients), (*Algae, *Limnology), Phosphorus, Sources, Bioassay, Nitrogen, Mud, Adsorption, Acetylene, Rainfall, Surface water runoff, Ecology.
Identifiers: *Water pollution effects (Plants).

Bioassays for nutrient availability were evaluated to define conditions and limits under which each method can give meaningful results. The biological availability of algal nutrients in a water sample and the algal response to changes in the growth-limiting nutrient were measured. Factors other than insolubility prevent the nitrogen or phosphorus of certain samples of aerobic lake muds from being readily available for algal growth. The facts, that live algae and aquatic weeds do not share their adequate or surplus nutrients with nutrient-limited algae and that lake muds do not provide readily available nitrogen or phosphorus, indicate that once lake waters are stripped of available nutrients by plant production, further plant production will depend upon nutrients from continuous sources, such as wastewater effluents. Phosphorus-starved cells of Anabaena rapidly increase their capacity to reduce acetylene to ethylene when they receive phosphorus. This response may be used as a bioassay for detecting available phosphorus in aquatic ecosystems. (Author)

PB-210 710
California Univ., San Diego, La Jolla. Inst. of Marine Resources.
EUTROPHICATION IN COASTAL WATERS: NITROGEN AS A CONTROLLING FACTOR.
Water pollution control research series.

Dec 71, 68p W72-10611, EPA-16010-EHC-12/71
Paper copy available from GPO $0.70 as EP2.10:16010EHC12/71.

Descriptors: (*Oceans, *Outfall sewers), (*Outfall sewers, *Water pollution), Marine biology, Phytoplankton, Primary biological productivity, Nitrogen, Ammonia, Ammonium compounds, Nitrates, Metabolism, Nutrients, Coasts.
Identifiers: *Ocean waste disposal, Liquid waste disposal, *Water pollution effects (Plants), *Eutrification, *Environmental biology.

The Southern California coastal sewage outfalls were investigated in relation to their effect upon standing stocks of phytoplankton, and on primary production. Kinetic parameters for the assimilation of ammonium, nitrate, and urea were determined at the outfall sites using N-15 labeled substrates. Laboratory studies investigated the utilization of various forms of nitrogen by phytoplankton, mechanisms and rates of nitrogen assimilation, and enzymes of nitrogen assimilation. It was found that the maximum growth rate was a variable, while the saturation constant was uniform over a range of dilution rates of N-limited chemostat cultures. The chemical composition of phytoplankton varied with dilution rate in reproducible ways. By varying the dilution rate of such cultures one seems to regulate the degree of nitrogen-deficiency of the phytoplankton.

PB-210 716
Research Corp. of New England, Hartford, Conn.
ENFORCEMENT MANAGEMENT SYSTEM. USERS GUIDE.

Mar 72, 218p* TRC-42-088-00 APTD-1120
Contract EPA-68-02-0079

Descriptors: (*Air pollution, *Law enforcement), (*Management systems, Air pollution), Abatement, Data processing, Monitors, Sources, Scheduling, Management engineering, Data acquisition, Information systems.

A system was developed for use by air pollution agencies at the state and local levels. The system records, monitors, summarizes agency actions in the enforcement and surveillance area. It provides staff members with schedules of planned future actions and summaries of emission source oriented data. The system is available in three versions, tailored to agencies of different resource levels. Two of the levels are computerized and provide automatic monitoring of operational activities.

PB-210 717
Environmental Measurements, Inc., San Francisco, Calif.
SO2 AND NO2 MEASUREMENTS. SOUTHERN CALIFORNIA, 18-22 OCTOBER, 1971.
Dec 71, 29p APTD-1147
Contract EPA-6H-02-0124

Descriptors: (*Air pollution, *Infrared detection), (*Nitrogen dioxide, Gas detectors), (*Sulfur dioxide, Gas detectors), Monitors, Performance evaluation, Calibration, Wind (Meteorology), Industrial wastes, Plumes.
Identifiers: *Air pollution detection.

Independent remote-sensing data were desired for comparisons to final acceptance tests of infrared remote sensors. A dual-gas correlation spectrometer was used to measure sulfur dioxide (SO2) and nitrogen dioxide (NO2) simultaneously. Perimeter measurements were made in the general vicinity of an industrial area in Southern California. Next a comparison was made between the COSPEC II Correlation Spectrometer and the COSPEC III version.

PB-210 736
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
PAINT TECHNOLOGY AND AIR POLLUTION: A SURVEY AND ECONOMIC ASSESSMENT,
J. W. Spence, and F. H. Haynie. Feb 72, 49p* AP-103
Paper copy also available from SOD: as EP 4.0:103 PC$0.35.

Descriptors: (*Paints, *Atmospheric corrosion), (*Air pollution, Atmospheric corrosion), Deterioration, Reviews, Economic analysis, Hydrogen sulfide, Sulfur dioxide, Particles, Latex, Enamel paints, Painting.
Identifiers: *Air pollution effects (Materials), *Air pollution economics, *Paint industry.

The objectives were to survey the technical developments occurring within the paint industry, to identify the characteristics of pollutant attacks on exterior paints, and to estimate the annual cost of air pollutant damage to such paints. New paint formulations and new application techniques are emerging within the paint industry. The chemical attack of certain air pollutants on exterior finishes is reviewed. An economic assessment was made of the chemical damage of air pollutants on four classes of exterior paints: Household, Automotive refinishing, Coil coating, and Maintenance. The total estimated cost at the consumer level is given.

PB-210 739
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
SYSTEMATIC FIELD STUDY OF NO (X) EMISSION CONTROL METHODS FOR UTILITY BOILERS,
William Bartok, Allen R. Crawford, and Gregory J. Piegari. 31 Dec 71, 229p* GRU4GNOS71 APTD-1163
Contract CPA-70-90

Descriptors: (*Boilers, *Combustion products), (*Air pollution, *Nitrogen oxides), (*Combustion, Boilers), Furnaces, Field tests, Natural gas, Coal, Fuel oil, Design criteria, Gas sampling, Statistical analysis, Process variables, Carbon monoxide, Electric power plants, Gas burners, Oil burners.
Identifiers: *Air pollution control.

A utility boiler field test program was conducted. The objectives were to determine new or improved NO (x) emission factors by fossil fuel type and boiler design, and to assess the scope of applicability of combustion modification techniques for controlling NO (x) emissions from such installations. A statistically designed test program was conducted with the cooperation of utility owner-operators. The objective was to make the boilers selected a reasonable 'micro-sample' of the U.S. boiler population. The NO2 portion of the total NO (x) content in the flue gas was found to average five percent or less. Major combustion operating parameters investigated included the variation of boiler load, level of excess air, firing pattern (staged, 'off-stoichiometric', or 'biased firing'), flue gas recirculation, burner tilt, and air preheat temperature. Modification of combustion operating conditions offers good promise for the reduction of NO (x) emissions from utility boilers.

PB-210 753
California Univ., Davis.
A QUICK BIOCHEMICAL OXYGEN DEMAND TEST.

Jun 71, 48p W72-10871, EPA-16050-EMF-06/71

Paper copy available from GPO $0.60 as EP2.10: 16050 EMF 06/71.

Descriptors: (*Biochemical oxygen demand, Tests), Sewage treatment, Industrial waste treatment, Quantitative analysis, Biochemistry, Errors.
Identifiers: *Chemical oxygen demand, Biological industrial waste treatment, Water pollution detection.

A satisfactory, short term biological oxygen demand test suitable for operational control of waste treatment processes was developed. The Total Biological Oxygen Demand T (BOD) test, a mass culture technique which utilizes the change in chemical oxygen demand as resulting from bacterial action, was chosen as the basic system. Because the T (BOD) test was developed for and is conceptually limited to soluble wastewaters, considerable modification of the basic test was necessary. Results show that the modified T (BOD) test can be utilized for the determination of the oxygen demand of nonsoluble wastewaters. Values were not affected by dilution as long as the initial (time equals O) wastewater COD value was greater than 100 mg/l. Of greater utility is the development of COD vs T (BOD) correlations for a specific wastewater, however.

PB-210 759
Environmental Systems Corp., Knoxville, Tenn.
DEVELOPMENT AND DEMONSTRATION OF LOW-LEVEL DRIFT INSTRUMENTATION.
F. M. Shofner, and C. D. Thomas. Oct 71, 57p
W72-10818, EPA-16130-GNK-10/71
Paper copy available from GPO $0.65 as EP2.10:16130GNK10/71.

Descriptors: (*Particles, *Detectors), (*Cooling towers, Air pollution), (*Air pollution, Particles), (*Optical radar, Air pollution), Backscattering, Semiconductor lasers, Design, Pulse analyzers, Signal processing, Gas sampling, Samplers, Plumes, Calibration, Performance evaluation, Holography, Velocity.
Identifiers: PILLS detection, *Air pollution detection.

Instrumentation for measurement of low level drift from cooling towers was developed. Emphasis was placed on the Particulate Instrumentation by Laser Light Scattering (PILLS) System which is capable of on-line measurement and, with incorporation of existing pulse height analyzer and mini-computer equipment, complete on-line data production. Complementary techniques of isokinetic sampling (IK) and sensitive paper sampling were developed and field proven. Feasibility was demonstrated for an infrared in-line holocamera system. The design principles and engineering trade-offs for the PILLS, IK, and sensitive paper techniques are described. Drift performance data are given for a small air conditioning cooling tower unit, two large mechanical draft cooling towers, and a natural draft tower. (Author)

PB-210 778
Beck (R. W.) and Associates, Denver, Colo.
RESEARCH ON DRY-TYPE COOLING TOWERS FOR THERMAL ELECTRIC GENERATION. PART II,
John P. Rossie, and Edward A. Cecil. Nov 70, 105p W72-10810, EPA-16130-EES-11/70
Contract FWPA-14-12-823
See also Part 1, PB-206 954.
Paper copy available from GPO $1.00 as EP2.10: 16130 EES 11/70.

Descriptors: (*Cooling towers, Optimization), (*Thermal power plants, Cooling towers), (*Computer programs, Programming manuals), Water pollution, Economic analysis, Cost analysis, Industrial waste treatment, Water flow, Heat transfer, FORTRAN.
Identifiers: Natural draft cooling towers, OPTDCT computer program, TOWSIZ computer program.

The study of dry-type cooling towers was facilitated by the development of two computer programs to aid in the analysis of the large quantity of data. The two programs are described in detail and instructions for their operation are provided. The physical dimensions of a natural-draft cooling tower and its capital cost are evaluated by the program titled TOWSIZ. The economically optimum dry cooling system is determined by the program titled OPTDCT. Flow charts and program listings along with output samples are given. Programs were coded in Fortran IV. (Author)

PB-210 806
Bowles Fluidics Corp., Silver Spring, Md.
FLUIDIC VORTEX BUBBLE GENERATOR.
Water pollution control research series.

Feb 72, 78p W72-11090, EPA-17030-FEB-02/72
Contract EPA-14-12-863
Paper copy available from GPO $1.00 as EP2.10:17030FEB02/72.

Descriptors: (*Bubbling, Equipment), (*Flotation, Bubbling), (*Suspended sediments, Flotation), Vortices, Design, Nozzles, Dissolved gases, Entrainment, Sewage treatment, Industrial waste treatment.

An engineering investigation and evaluation of vortex devices as bubble makers for use in the removal of suspended solids from wastewaters was conducted. Specific objectives included the development and test of bubble makers capable of generating bubbles having mean diameters of about 100 microns with vortex devices having minimum liquid passageways of 1/4 inch or greater. Bubbles having a mean diameter of 80 to 85 microns, with virtually no bubbles greater than 130 microns, were successfully produced. This mean size and size range are substantially the same as bubbles produced by pressurized water processes at similar operating pressures. Bubbles were produced both by aspirating atmospheric air directly into the vortex unit, and by aspirating atmospheric air at the suction side of the pump, dissolving it, and precipitating it or effervescing it at the vortex unit. Sufficient data now exist, however, to design vortex systems for direct functional tests in conventional air flotation systems.

PB-210 836
Thermo Electron Corp., Waltham, Mass. Research and Development Center.
DETAILED DESIGN: RANKINE-CYCLE POWER SYSTEM WITH ORGANIC-BASED WORKING FLUID AND RECIPROCATING EXPANDER FOR AUTOMOBILE PROPULSION. VOLUME I. TECHNICAL REPORT.
5 May 72, 27[illegible]34-71-72-Vol-1 APTD-1154
Contract EP[illegible]-70-102
See also Volume 2, PB-210 837.

Descriptors: (*Automobile engines, Rankine cycle), External combustion engines, Reciprocating engines, Design, Performance evaluation, Exhaust emissions, Fluorinated hydrocarbons, Automotive fuels.
Identifiers: *Rankine cycle power systems.

The system is based on use of an organic-based working fluid with reciprocating expander. The working fluid used is Fluorinol-85, a mixture of 85 mole percent trifluorinol and 15 mole percent water. The detailed, optimized design of the system including packaging of the complete system in the reference car, the 1972 Ford Galaxie is described. The results of experimental development in several critical areas are also presented. The system is designed to provide performance approximately equivalent to use of a 351 cubic inch displacement internal combustion engine in the reference car. (Author)

PB-210 837
Thermo Electron Corp., Waltham, Mass. Research and Development Center.
DETAILED DESIGN: RANKINE-CYCLE POWER SYSTEM WITH ORGANIC-BASED WORKING FLUID AND RECIPROCATING EXPANDER FOR AUTOMOBILE PROPULSION. VOLUME II. APPENDICES.

5 May 72, 260p* TE-4134-71-72-Vol-2 APTD-1155
Contract EPA-EHSH-70-102
See also Volume 1, PB-210 836.

Descriptors: (*Automobile engines, Rankine cycle), External combustion engines, Reciprocating engines, Design, Performance evaluation, Engine valves, Feed pumps, Seals (Stoppers), Exhaust emissions, Lubricants, Burners, Automatic transmissions.
Identifiers: *Rankine cycle power systems.

Eight appendices are presented: they are: Analysis of Mechanical Valve Gear; Five Cylinder Axial Feedpump; Rotary Shaft Seal; Evaluation of a Ball Matrix as an Extended Surface; Engine Bearing-Lubricant Testing for Rankine Cycle Reciprocating Expander; Steady-State and Transient Emission Measurements from Automotive Rankine Cycle Burner; Dana Transmission; and Development Schedule and Task Breakdown. (Author)

PB-210 855
Envirometrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: DIRECTOR'S GUIDE.
Water pollution control research series.

Dec 71, 231p W72-11171, EPA-16110-FRU-12/71-2
Contract FWPCA-14-12-959
See also PB-210 703
Paper copy available from GPO $1.75 as EP2.10: 16110 FRU 12/71-2.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), Gaming models, Mathematical models, Computer programming, Organizing, Strategies.
Identifiers: Water pollution abatement, River Basin Model.

The River Basin Model is a man-machine simulation model used to delineate the interactions taking place, within a real or hypothetical area, between the local water system and the economic, social, and governmental activities of that area; it is a model of an entire regional system, with water a subsystem realistically interacting with all the other major subsystems, such as transportation. The Director is responsible for the operation of the Model in a gaming mode. Presented is a manual describing what the Director needs to know in order to operate the Model, influence play, answer questions and use the Model to meet established objectives. Pregame--responsibilities before the start of a program, such as choice of structure and formation of teams; Optional formats--provision for complementary activities, such as town meetings and mass media presentations; and Model operations--details for operating the Model itself.

PB-210 858
FMC Corp., Santa Clara, Calif. Central Engineering Labs.
A FLUSHING SYSTEM FOR COMBINED SEWER CLEANSING.
Water pollution control research series.

Mar 72, 230p W72-11089, EPA-11020-DNO-03/72
Contract FWQA-14-12-466
Paper copy available from GPO $1.75 as EP2.10: 11020 DNO 03/72.

Descriptors: (*Combined sewers, *Flushing), Mathematical models, Efficiency, Deposits, Sediments, Hydraulic equipment.
Identifiers: Storm sewers.

Full-scale tests were conducted on two variable-slope test sewers (12- and 18- inch diameters), during which solids were first allowed to build up by passing domestic sewage through the sewers for durations of 12 to 40 hours and then were removed by hydraulic flushing. Formulas were developed which gave satisfactory predictions of several cleansing efficiencies and wave depths for the flush waves and sewer sizes studied. A prototype flush station developed can be inserted in a manhole to provide the functions necessary to pick up sewage from the sewer, store it in a coated fabric tank, and release the stored sewage as a flush wave upon receipt of an external signal. An estimate of costs of periodically flushing combined sewer laterals are given.

PB-210 859
Envirometrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: SCHOOL DEPARTMENT.
Water pollution control research series.

Dec 71, 96p W72-11272, EPA-16110-FRU-12/71-7
Contract FWPCA-14-12-959
See also PB-210 855.
Paper copy available from GPO $1.00 as EP2.10: 16110 FRU 12/71-7.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), (*Education, River basin development), Schools, Gaming models, Mathematical models, Mapping, Demography, Interactions, Land use, Training devices, Government policies, Economic factors.
Identifiers: Water pollution abatement, River Basin Model.

The River Basin Model and its users represent an entire regional system's economic, social, and governmental activities; water decisions are placed within their realistic context of having different importance to different individuals as a function of their occupation, interaction, computer-simulation decision-making tool. Presented is a description of the functions of the Government Sector and the model required by its School Department. The School Department provides child and adult education for citizens in the local jurisdictions. The demand for school services within a district is dependent upon the number and class of population units located within the boundaries of the school district.

PB-210 860
Envirometrics, Inc., Washington, D.C.
THE BASIN MODEL: SOCIAL SECTOR.
Water pollution control research series.

Dec 71, 122p W72-11273, EPA-16110-FRU-12/71-4
Contract FWPCA-14-12-959
Paper copy available from GPO $1.25 as EP2.10; 16110 FRU 12/71-4.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), (*Socioeconomic status, River basin development), Gaming models, Mathematical models, Mapping, Demography, Economic factors, Interactions, Land use, Training devices.
Identifiers: Water pollution abatement, River Basin Model, Boycotts.

The River Basin Model is not primarily a water management model. Through human interaction and computer simulation, it represents the entire complex economic, social, and governmental activities taking place within a specified local system. The manual contains the basic information and description of the model required by the social sector. It is assumed that the Model Overview and the Scenario descriptions have been read prior to the receipt of this manual. Once the players comprising the Social Sector have become familiar with the model in general, the particular city being represented, and the workings of the local economic, social, and government system they will be able to bring their own imagination and initiative to bear on the operation of the Social Sector and the population groups they represent. (Author)

PB-210 861
Envirometrics, Inc., Washington, D.C.
THE BASIN MODEL: ECONOMIC SECTOR.
Water pollution control research series.

Dec 71, 156p W72-11274, EPA-116110-FRU-12/71-3
Contract FWPCA-14-12-959
Paper copy available from GPO $1.25 as EP2.10: 16110 FRU 12/71-3.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), (*Economic factors, River basin development), Gaming models, Mathematical models, Mapping, Demography, Interactions, Socioeconomic status, Farms, Land use, Industries, Training devices.
Identifiers: Water pollution abatement, River Basin Model, Boycotts.

The River Basin Model is not primarily a water management model. It is a human interaction, computer-simulation decision-making tool, representing the entire complex economic, social, and governmental activities occurring within a specified local system. Its users represent the major economic, social, and governmental decision-makers who cause the regional system to function on a year-to-year basis. The manual contains the basic information and description of the model required by the Economic Sector. Economic teams are given the opportunity and responsibility for operating and creating any growth in the economic resources of the local system. Players in this sector have the chance to use this opportunity in such a way as to satisfy self-established goals and/or to respond to pressures brought on it by government officials, the local citizenry, and the rest of the business community.

PB-210 883
Cincinnati Univ., Ohio. Kettering Lab.
BIOLOGICAL ASPECTS OF LEAD: AN ANNOTATED BIBLIOGRAPHY. PART I. LITERATURE FROM 1950 THROUGH 1964,
Irene R. Campbell, and Estelle G. Mergard. May 72, 568p AP-104-Pt-1
See also Part 2, PB-210 884.
Paper copy available from GPO $6.75 as EP4.9:104.

Descriptors: (*Environmental surveys, *Lead), (*Bibliographies, Lead), (*Public health, *Lead poisoning), (*Industrial medicine, Lead poisoning), Water pollution, Air pollution, Toxicology, Humans, Animals, Food contamination, Plants (Botany), Toxic tolerances, Chemical analysis, Chemical reactions, Abstracts, Lead inorganic compounds, Lead organic compounds, Tetraethyl lead.
Identifiers: Water pollution effects (Animals), Water pollution effects (Plants), Air pollution effects (Animals), Air pollution effects (Plants).

A bibliography with 4103 abstracts covering literature dating from 1950 through 1964 is presented. In this first volume of the two volume report, the first section includes abstracts of books, historical publications, proceedings of conferences, and general reviews. Specific reviews and discussions are included in the sections dealing with those aspects. Section II covers lead in the environment, including contamination of food by utensils and pesticides, and contamination of home water supplies by lead pipes, cisterns, etc. Also surveyed were signs, symptoms, and cases of clinical poisoning of man.

PB-210 884
Cincinnati Univ., Ohio. Kettering Lab.
BIOLOGICAL ASPECTS OF LEAD: AN ANNOTATED BIBLIOGRAPHY. PART II. LITERATURE FROM 1950 THROUGH 1964,
Irene R. Campbell, and Estelle G. Mergard. May 72, 380p AP-104-Pt-2
See also Part 1, PB-210 883.
Paper copy available from GPO $6.75 as EP4.9:104.

Descriptors: (*Environmental surveys, *Lead), (*Bibliographies, Lead), (*Public health, *Lead poisoning), (*Industrial medicine, Lead poisoning), Water pollution, Air pollution, Toxicology, Humans, Animals, Food contamination, Plants (Botany), Toxic tolerances, Chemical analysis, Chemical reactions, Abstracts, Lead inorganic compounds, Lead organic compounds, Tetraethyl lead, Law (Jurisprudence).
Identifiers: Water pollution effects (Animals), Water pollution effects (Plants), Air pollution effects (Animals), Air pollution effects (Plants).

In this volume, the first section concerns signs, symptoms, and cases of clinical poisoning appearing in Man. Abstracts of reports on industrial atmospheres and occupational exposure are given, and related medical information is covered. Another section includes pollution by lead of air, soil, and water, and the effects of such pollution on humans, animals, and plants under actual (field) conditions of exposure. Legal matters, regulations, and recommendations for threshold concentrations, maximum allowable concentrations, drinking water standards, and tolerance limits for food products were covered. A large amount of analytical techniques are abstracted along with a section on lead's chemistry and technology.

PB-210 968
Battelle-Pacific Northwest Labs., Richland, Wash.
NATURAL PRECIPITATION WASHOUT OF SULFUR DIOXIDE,
M. T. Dana, J. M. Hales, and M. A. Wolf. Feb 72, 153p* BNW-389 APTD-1127
See also PB-203 129.

Descriptors: (*Air pollution, *Sulfur dioxide), (*Precipitation (Meterology), Air pollution), Mathematical models, Rainfall, Solubility, Plumes, Atmospheric condensation, Field tests, Scavenging, Electric power plants.
Identifiers: *Precipitation washout.

Recent results are presented in the continuing investigation of SO2 washout by precipitation from plumes of large, coal-fired power plants. The research consisted of three phases: a washout modeling effort, a laboratory investigation of solubility and mass-transfer behavior in the SO2/water system, and an experimental field program. The modeling effort resulted in the creation of two washout models. The first of these is based on linear theory and provides a relationship that can be used for hand-calculated estimates of washout provided that the implicit assumption of vertical rainfall is not violated significantly. The second model can account for nonlinear behavior and is not restricted to vertical rainfall, but necessitates computer calculation to predict washout values. Solubility experiments were conducted. The field-study program was conducted on the Olympic Peninsula of Washington state to examine the washout of SO2 in an unpolluted atmosphere. Irreversible washout was shown to be untenable. Predictions from the nonlimiting washout models were found to agree well with experiments.

PB-211 020
Rex Chainbelt, Inc., Milwaukee, Wis. Ecology Div.
REVERSE OSMOSIS DEMINERALIZATION OF ACID MINE DRAINAGE.
Water pollution control research series.

Mar 72, 113p W72-11598, EPA-14010-FQR-03/72
Paper copy available from GPO $1.00 as EP2.10:14010 FQR 03/72.

Descriptors: (*Mine waters, *Osmosis), (*Demineralizing, Mine waters), (*Water pollution, Mine waters), Field tests, Filtration, Disinfection, Ultraviolet radiation, Fouling, Corrosion prevention, Water treatment, Potable water, Chemical removal (Water treatment), Iron, Manganese, pH.
Identifiers: *Mine acid drainage, *Reverse osmosis, *Water pollution control, Tubular membranes, Hollow fiber membranes.

A two-phase study, involving both laboratory and field investigations, has demonstrated the feasibility of using reverse osmosis to provide potable water from acid mine drainage. The laboratory investigations involved the determination of methods for controlling iron fouling and the selection of a process flow sheet. During the field test, the process developed in Phase I was used to treat acid mine drainage from an underground abandoned anthracite coal mine. Treatment prior to reverse osmosis consisted of filtration (10 microns) followed by ultraviolet light disinfection. Brine from the RO unit was treated by neutralization, oxidation, and settling. Results obtained indicated that membrane fouling due to iron was satisfactorily controlled, but calcium sulfate fouling limited the recovery of product water to about 75%. Product water was of potable quality in all respects except for iron, manganese, and pH. Calcium sulfate precipitate on the RO membrane was successfully removed using a solution of ammoniated citric acid at pH 8. (Author)

PB-211 021
Green Bay Packaging, Inc., Wis. Mill Div.
RECYCLE OF PAPERMILL WASTE WATERS AND APPLICATION OF REVERSE OSMOSIS.
Water pollution control research series,
David C. Morris, William R. Nelson, and Gerald O. Walraven. Jan 72, 93p W72-11599, EPA-12040-FUB01/72
Paper copy available from GPO $1.00 as EP2.10:12040FUB01/72.

Descriptors: (*Paper industry, Industrial waste treatment), (*Industrial waste treatment, *Osmosis), Water reclamation, Industrial wastes, Water pollution, Control, Performance evaluation, Design, Flux (Rate), Cellulose acetate, Membranes, Fouling, Heat treatment, Dissolved organic matter.
Identifiers: *Reverse osmosis, *Water pollution control, *Waste water reuse, Dissolved solids, Tubular membranes.

Pilot plant reverse osmosis (R.O.) units were operated on weak waste waters from a pulp and paperboard mill to obtain further data on R.O. as an integral part of a closed water system within the mill. Of the many equipment types tested, the one selected was capable of concentrating a stream containing 1% dissolved solids to 99% less volume containing 10% dissolved solids. Product water thus separated was of high quality, suitable for use for stock dilution, pump shaft seal lubrication, etc. Overall flux rate for the operating portion of a plant performing to these standards was about 7 gallons/sq ft/day. The cellulose acetate membranes exhibited no significant deterioration, and a conclusion that the membranes are capable of providing a minimum of one year of continuous service is encouraged. Limited testing at higher temperatures indicated that the membranes do not deteriorate as rapidly as predicted.

PB-211 022
Michigan State Univ., East Lansing. Agricultural Pollution Control Lab.
CLOSED SYSTEM WASTE MANAGEMENT FOR LIVESTOCK.
Water pollution control research series,
Patrick O. Ng, Jr., Jerome P. Harper, Robert K. Collins, Grant D. Wells, and Farouk A. Heidar.
Jun 71, 113p W72-11600, EPA-13040-DKP06/71
Paper copy available from GPO $1.25 as EP2.10:13040DKP06/71.

Descriptors: (*Agricultural wastes, *Industrial waste treatment), (*Livestock, Agricultural wastes), (*Filtration, Agricultural wastes), Separators, Sizing screens, Separation, Swine, Beef cattle, Centrifugal filtration, Feeding stuffs, Biochemical oxygen demand, Nitrogen, Phosphorus, Chemical analysis, Performance evaluation, Sand filtration, Composts, Anaerobic processes, Aerobic processes, Odor control, Dissolved organic matter.
Identifiers: Manure, *Water pollution control, *Feedlot wastes, *Hog houses, Chemical oxygen demand, Biological industrial waste treatment.

A vibrating screen separator has been developed for liquid-solid separation of livestock wastewater. Pilot tests on swine and beef cattle wastewater have shown that the resistant or slowly biodegradable solids are effectively removed on vibrating screens ranging in mesh size from No. 60 to No. 120. Although measurably less efficient than conventional dewatering devices such as centrifuges and vacuum filters, the gravity dewatering vibrating screen separation is better suited to the economic scale of the average livestock operation. The removal of resistant solids from wastewater prior to stabilization substantially improves the performance of biological treatment systems by enhancing the controlling transport and kinetic mechanisms in such processes. The liquid fraction can be partially reclaimed by biodegradation and recycled as transport water. A number of candidate livestock waste management designs integrating the salient features of the study have been proposed.

PB-211 023
Beefland International, Inc., Council Bluffs, Iowa.
ELIMINATION OF WATER POLLUTION BY PACKINGHOUSE ANIMAL PAUNCH AND BLOOD.
Water pollution control research series.

Nov 71, 47p W72-11601, EPA-12060-FDS-11/71
Paper copy available from GPO $0.50 as EP 2.10: 12060 FDS 11/71.

Descriptors: (*Food processing, *Industrial waste treatment), (*Beef cattle, Food processing), Livestock, Blood, Dewatering, Cost estimates, Feasibility, Separation, Waste disposal, Dehydrators, Capital costs, Operating costs, Clarification, Lagoons (Ponds), Aeration, Biochemical oxygen demand.
Identifiers: *Slaughtering house wastes, *Water pollution control, Paunch, Chemical oxygen demand, Food supplements, *Blood dehydration.

At a beef slaughtering plant, the kill capacity can be 250 animals per hour. In a ten-hour day this represents a tremendous quantity of blood, paunch, and manure, which must be disposed of in such a way so as not to further tax the waste-carrying capacity of the nearby rivers or to increase the ever growing problem of pollution of air, land, and water. Thus it was decided to test facilities for the drying of the whole blood and the paunch contents of rumen generated in the slaughtering operation. The manure would be disposed of directly for agricultural fertilizer. The project demonstrates the economic and technical feasibility of completely separating the blood and rumen generated in the slaughter operation, and drying of these materials with a view toward the sale of the dehydrated products as animal feeds or for feed additives.

PB-211 024
Oklahoma State Univ., Stillwater. School of Civil Engineering.
AEROBIC DIGESTION OF ORGANIC WASTE SLUDGE.
Water pollution control research series.

Dec 71, 184p W72-11603, EPA-17070-DAU-12/71
Paper copy available from GPO $1.50 as EP2.10: 17070 Dau 12/71.

Descriptors: (*Sudge digestion, *Aerobic processes), (*Sewage treatment, Sludge digestion), Process variables, Pilot plants, Aeration, Settling, Chemical removal (Sewage treatment), Biochemical oxygen demand, pH, Nitrogen, Phosphorus.
Identifiers: Chemical oxygen demand.

Many new ideas for sludge treatment and disposal have been proposed and put into use in recent years. The method most commonly used is that of anaerobic digestion followed by dewatering of sludge. However, for at least the last 10 or 15 years aerobic sludge digestion has been used or experimented with. Aerobic sludge digestion is a process in which waste sludges are subjected to aeration by various means to reduce the amount of sludge and to make it less objectionable estheticly. Pilot plant aerobic sludge digesters were used to treat sludge from a two stage trickling filter plant. Primary sludge only, mixed primary and secondary sludge, and secondary sludge only, were digested at detention periods. Physical and chemical analyses were made. Data indicated considerable variation in concentration of the various parameters with aeration time and sludge source. Results showed that aerobic digestion was a highly variable process which could produce excellent results in some cases, while yielding highly undesirable results in similar cases.

PB-211 025
Connecticut Univ., Storrs. Biological Sciences Group.
CHARACTERIZATION OF TASTE AND ODORS IN WATER SUPPLIES.
Water pollution control research series,
Ralph P. Collins. Aug 71, 20p W72-11604, EPA-16040-DGH-08/71
Paper copy available from GPO $0.35 as EP2.10:16040DGH08/71.

Descriptors: (*Water supply, *Odors), (*Taste, Water supply), (*Aquatic microbiology, Odors), Algae, Fungi, Actinomycetaceae, Gas chromatography, Infrared spectra, Mass spectra, Nuclear magnetic resonance, Water pollution, Water quality, Streptomyces.
Identifiers: Trichoderma viride, Synura.

An examination of the odorous constituents produced by microorganisms which are involved in taste and odor problems in public water supplies was conducted. The organisms used in the study were the actinomycete Streptomyces odorifer, the alga Synura petersenii, and the fungus Trichoderma viride. The odorous constituents produced by these organisms were obtained by steam distillation of the culture medium containing the cells. Analysis of the extracts was made by gas chromatography, infrared, mass and nuclear magnetic spectroscopy. The major odorous constituents produced by Streptomyces odorifer have been identified. A large number of odorous constituents were also identified from the culture filtrates Synura petersenii. The major odorous compound produced by Trichoderma viride was also determined.

PB-211 026
Scott Paper Co., Westbrook, Maine. S.D. Warren Div.
SLUDGE MATERIAL RECOVERY SYSTEM FOR MANUFACTURERS OF PIGMENTED PAPERS.
Water pollution control research series.

Jul 71, 97p W72-11605, EPA-12040-FES-07-71
Paper copy available from GPO$1.00 as EP2.10: 12040 FES 07/71.

Descriptors: (*Paper industry, *Industrial waste treatment), (*Pigments, *Materials recovery), (*Sludge disposal, Paper industry), Incinerators,

Papermaking, Pulp additives, Finishes, Fluidized bed processors, Cost estimates, Dewatering, Waste disposal.
Identifiers: *Water pollution control, Waste recycling, Rotary kilns.

Disposal of the sludge that results from primary treatment of waste waters generated during the manufacture of coated and/or filled papers has caused many problems. A process has been developed and tested in a full scale mill trial wherein the pigment present in the waste sludge was reclaimed through incineration of the volatile components of the sludge. In essence, the process consisted of operations in which the sludge resulting from the primary treatment process was diluted to less than 0.75% solids, centri-cleaned, dewatered to 30% solids, shredded, dried, and burned in a rotary kiln. The ash that resulted - the pigment - was then pulverized and used as filler pigment in the papermaking process. The process was shown to be economically unfeasible at the present time. (Author)

PB-211 027
Rex Chainbelt, Inc., Milwaukee, Wis. Ecology Div.
AMENABILITY OF REVERSE OSMOSIS CONCENTRATE TO ACTIVATED SLUDGE TREATMENT.
Water pollution control research series.

Jul 71, 123p W72-11606, EPA-17040-EUE-07/71
Paper copy available from GPO $1.25 as EP2.10:17040 EUE 07/71.

Descriptors: (*Sewage treatment, *Osmosis), Activated sludge process, Water supply, Performance evaluation, Membranes, Feasibility, Dissolved organic matter, Precipitation (Chemistry), Feedwater treatment, Fouling, Cellulose acetate, Suspended sediments, Pilot plants, Clarification, Chemical removal (Water treatment).
Identifiers: Tubular membranes, Spiral wound membranes, *Reverse osmosis.

Pilot scale tubular and spiral wound Reverse Osmosis (RO) units were used to establish the feasibility of renovating municipal sewage. Results indicated that prior treatment with ferric chloride and alum will be necessary even when using the tubular RO system. RO produced an approximate 100 mg/ TDS of inorganic ions in the effluent, but an estimated 40 to 50% of the soluble organic material permeated the membranes at high feed water recoveries. Approximately 70% of the organic material passing the membrane was ethanol, but other organics may pass through the membranes from other sewages. 92% water recovery rates, with no precipitation problems in the RO concentrate, were achieved, but RO product waters would require further treatment for organic removal prior to discharge. The feasibility of biodegrading RO concentrates was also established.

PB-211 035
Radian Corp., Austin, Tex.
A THEORETICAL STUDY OF NOX ABSORPTION USING AQUEOUS ALKALINE AND DRY SORBENTS. VOLUME I.
Final rept.,
Philip S. Lowell, and Terry B. Parsons. 31 Dec 71, 98p* RAD-71-200-007-01 APTD-1162
Contract EPA-EHSD-71-5
See also volume 2, PB-211 058.

Descriptors: (*Air pollution, *Nitrogen oxides), (*Air pollution control equipment, *Scrubbers), (*Adsorbents, Oxides), (*Adsorption, Nitrogen oxides), Adsorptivity, Dissolving, Flue gases, Thermodynamic properties, Reaction kinetics, Chemical equilibrium, Theories, Electric power plants, Mathematical models, Solutions, Inorganic nitrates, Inorganic nitrites.
Identifiers: *Alkaline scrubbing, *Air pollution control.

The study was carried out to develop a theoretical description of aqueous scrubbing processes for NOx emission control. The theoretical description is necessary to provide a basis for process development. The important chemical species present and the reactions they undergo in the sorption process were defined. An equilibrium model was developed so that the concentrations of the significant nitrogen-oxygen species present in the gas phase could be calculated under given conditions. A sorption mechanism and rate limiting step were proposed and an experimental program for testing them and providing engineering data was defined. Potential metal oxide sorbents were evaluated for effectiveness and efficiency on the basis of the thermodynamics of the sorption reactions. (Author)

PB-211 058
Radian Corp., Austin, Tex.
A THEORETICAL STUDY OF NOX ABSORPTION USING AQUEOUS ALKALINE AND DRY SORBENTS. VOLUME II.
Final rept.

31 Dec 71, 304p RAD-71-200-007-01 APTD-1138
Contract EPA-EHSD-71-5
See also Volume 1, PB-211 035.

Descriptors: (*Air pollution, *Nitrogen oxides), (*Adsorption, Nitrogen oxides), (*Adsorbents, Nitrogen oxides), (*Air pollution control equipment, *Scrubbers), Adsorptivity, Chemical equilibrium, Solutions, Inorganic nitrites, Inorganic nitrates, Columns (Process engineering), Flue gases, Mass transfer, Reviews, Thermodynamic properties, Nitric acide, Carbonates, Hydroxides, Oxides.
Identifiers: *Alkaline scrubbing, *Air pollution control.

Technical notes pertaining to, and developed during, a study of the theoretical description of aqueous scrubbing processes for NOx emission control are presented. The ten notes are as follows: Review of the literature on experimental studies of the aqueous absorption of nitrogen oxides; Gas phase equilibrium in the system NOx-H2O; Compilation of thermodynamic properties for compounds of interest in nitrogen oxides aqueous absorption processes; High temperature behavior of anhydrous and hydrated nitrites and nitrates; Material balance calculations for NOx aqueous sorption in a packed tower; Selected values for equilibrium constants used in the aqueous equilibrium formulation; Vapor film mass transfer coefficients for HNO2 and HNO3 in a packed tower; Results of literature search on aqueous sorption of nitrogen oxides; Calculation of decomposition pressures over metal nitrates and nitrites and; Listing of subroutines for the gas phase equilibrium model. (Author)

PB-211 072
Bureau of Mines, Washington, D.C.
IMPORT SUPPLEMENT TO OIL AVAILABILITY BY SULFUR LEVELS.

Jun 72, 55p*
See also report dated Aug 71, PB-202 281.

Descriptors: (*Crude oil, Availability), (*Fuel oil, Availability), (*Fuels, *International trade), Residual oils, Surveys, Sulfur, Air pollution, Concentration (Composition).
Identifiers: *Sulfur containing fuels, Imports, Air pollution abatement.

The document, a supplement to an initial report on 'Oil Availability by Sulfur Levels (PB-202 281),' presents data on imports of residual and fuel oils for the period January 1968 through December 1971. Also included are imports of distillate fuel oil for January 1970 through December 1971. Import data on these fuels were considered essential to acquiring an understanding of use distributions in the various areas and states. Presented is the quantity and sulfur content of the fuel oils. Other parameters deemed necessary were country from which the fuel oil came (source), United States port through which it came, and the carrier or company that imported the fuel oil. Analyses of such data in relation to legislature restrictions on sulfur content of fuel oils in the separate states are included.

PB-211 074
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XV. A THIRD COMPILATION OF TECHNICAL REPORTS ON THE BIOLOGICAL EFFECTS AND THE PUBLIC HEALTH ASPECTS OF ATMOSPHERIC POLLUTANTS,
M. Y. Nuttonson. Jul 72, 154p AICE-AIR-72-15
Grant EPA-R-800878
See also Volume 14, PB-209 945.

Descriptors: (*Air pollution, *Public health), (*USSR, Air pollution), (*Isocyanates, Toxicology), (*Aromatic hydrocarbons, Toxicology), (*Acroleins, Toxicology), (*Thiophenes, Toxicology), (*Phenols, Toxicology), (*Acetophenones, Toxicology), Acetone, Benzene, Xylenes, Toluene, Concentration (Composition), Toxic tolerances, Performance (Human), Standards, Blood analysis, Translations.
Identifiers: *Air pollution effects (Animals), Air pollution standards.

Contents:
- Maximum permissible concentrations of noxious substances in the atmospheric air of populated areas;
- Some aspects of the biological effect of microconcentrations of two chloroisocyanates;
- The toxicology of low concentrations of aromatic hydrocarbons;
- Chronic action of low concentrations of acrolein in air on the organism;
- Study of the reflex and resorptive effects of thiophene;
- Sanitary-toxicological appraisal of the combined effect of a mixture of benzene and acetophenone vapors in atmospheric air;
- Maximum permissible concentrations of phenol and acetophenone present together in atmospheric air;
- Sanitary evaluation of the combined action of acetone and phenol in atmospheric air;
- On the combined effect of low concentrations of acetone and acetophenone in air on the organism of man and animals;
- On the comparative toxicity of benzene, toluene, and xylene.

PB-211 124
Robert S. Kerr Water Research Center, Ada, Okla.
EFFECTS OF FEEDLOT RUNOFF ON WATER QUALITY OF IMPOUNDMENTS.
Water pollution control research series,
William R. Duffer, R. Douglas Kreis, and Curtis C. Harlin, Jr. Jul 71, 57p W72-11935, EPA-16080-GGP-07/71
Paper copy available from GPO $0.65 as EPA 16080 GGP 07/71.

Descriptors: (*Water pollution, Agricultural wastes), (*Beef cattle, Agricultural wastes), (*Surface water runoff, *Agricultural wastes), Water quality, Lagoons (Ponds), Fresh water biology, Ecology, Fishes, Dissolved gases, Oxygen, Nutrients, Phytoplankton, Zooplankton, Aquatic microbiology.
Identifiers: *Feedlot wastes, *Water pollution control, Water pollution effects (Animals), Fish-kill, Manure.

Effects of rainfall runoff from a beef cattle feedlot on the water quality of a small impoundment were determined. Changes in chemical concentration of

impounded water and changes in the community structure of aquatic organisms were measured and related to the amount and composition of feedlot runoff received. Water quality changes were also monitored in a nearby reservoir which received no feedlot runoff to serve as a control. Changes in chemical concentration or population structure of organisms were not apparent for discharges of about one-part feedlot runoff to 40 parts receiving water. Runoff discharges for two pumping periods with each contributing one-fourth of the volume of the receiving water were shown to degrade water quality in the impoundment. Several significant chemical and biological changes occurred. The most dramatic reduction in the biological community was the suffocation of about 90% of the game fish in the impoundment.

PB-211 127
Biospherics Inc., Rockville, Md.
BIOMASS DETERMINATION. A NEW TECHNIQUE FOR ACTIVATED SLUDGE CONTROL.
Water pollution control research series.

Jan 72, 118p W72-12006
Contracts EPA-14-12-419, EPA-14-12-871
Paper copy available from GPO $1.25 as EPA17050EOY01/72.

Descriptors: (*Activated sludge process, *Microorganism control (Sewage)), (*Biomass, Analyzers), (*Adenosine phosphates, *Bioluminescence), (*Sewage treatment, Microorganism control (Sewage)), Metabolism, Monitors, Tests, Process control.

Research was conducted to determine the feasibility of using adenosine triphosphate (ATP) as a measure of viable biomass in activated sludge. Methods were developed for the extraction of ATP from sludge and mixed liquor, and for the determination of ATP using the firefly bioluminescent procedure. Measurements of ATP were conducted on various pure cultures, pilot plant and full-scale activated sludge treatment plants. Additional parameters including BOD, TOC, oxygen uptake rate, and suspended solids were measured to provide comparative and supportive information. Preliminary tests in which ATP measurements of biomass were used to control the percent sludge return were conducted at two full-scale municipal sewage treatment plants. Lowered return sludge rates were found to produce effective treatment and increase the biological activity of the sludge. Results can be obtained within approximately ten minutes. (Author)

PB-211 128
Little (Arthur D.), Inc., Cambridge, Mass.
WASTE WOOL AS A SCAVENGER FOR MERCURY POLLUTION IN WATERS,
Joseph P. Tratnyek. Apr 72, 47p W72-12008, EPA-16080-HUB-04/72
Paper copy available from GPO $0.60 as EPA 16080 HUB 04/72.

Descriptors: (*Mercury, *Adsorptivity), (*Wool, *Adsorption), (*Water pollution, Mercury), Industrial wastes, Feasibility, Utilization, Sediments, Nylon fibers, Inorganic sulfides, Mercury organic compounds, Mercury inorganic compounds, pH, Fibers.
Identifiers: *Water pollution control.

Laboratory studies demonstrated the feasibility of using waste wool and wool/polyester blend fibers to remove mercury pollution from waters and bottom deposits. Nylon fiber was shown to have limited potential. Within 24 hours, 90-95% of mercury at the 1-ppm level was removed by the wool fiber. At higher levels of mercury, larger quantities were removed, but the percentage decreased. Changes in pH (2 to 10) and temperature (5 to 35 C) did not markedly alter efficacy of wool, nor did anaerobic conditions or variation in water hardness. However, the presence of sulfide in water or sediment reduced effectiveness of wool. Sources of mercury were mercuric chloride, methyl mercuric chloride, phenyl mercuric acetate, bis (2-methoxyethyl) mercury, and dissolved metallic mercury.

PB-211 129
Texas Univ., Austin. Dept. of Civil Engineering.
THE PESTICIDE MANUFACTURING INDUSTRY-CURRENT WASTE TREATMENT AND DISPOSAL PRACTICES,
Patrick R. Atkins. Jan 72, 190p W72-12009, EPA-12020-FYE-01/72
Paper copy available from GPO$1.50 as EPA 12020 FYE 01/72.

Descriptors: (*Pesticides, *Industrial waste treatment), (*Waste disposal, Pesticides), Manufacturing, Forecasting, Trends, Chemical industry, Oxidation, Adsorption, Biodeterioration, Flotation, Combustion, Earthfills, Injection wells, Ozonization, Activated sludge process, Aerobic processes, Lagoons (Ponds), Photochemical reactions, Cost estimates, DDT, Insecticides, Herbicides, Carbamates, Phosphorus organic acid esters, Aldrin, Dieldrin, Chlorine organic compounds, Endrin, Neutralizing, Air pollution, Water pollution.
Identifiers: *Water pollution control, Foam fractionation, Ocean waste disposal, Biological industrial waste treatment, Aeration ponds, Carbaryl, Lindane, Parathion, Methyl parathion, T 2-4-5 herbicide, D 2-4 herbicide, MCPA herbicide, Liquid waste disposal, Solid waste disposal.

An in-depth review of the literature, including government information documents, technical reports, the technical journals, industrial publications, and twenty plant interviews with plant managers and operators were used as the data base for studying the 'state of the art' of pesticide manufacturing waste treatment and disposal practices. The report contains chapters dealing with: The present and projected pesticide demands in the United States: The chemistry of pesticides including production processes and waste generation, Waste treatment possibilities discussed in the literature, Pesticide waste treatment systems that have been or currently are in full scale operation, and The cost of pesticide waste treatment system.

PB-211 130
Union Carbide Corp., South Charleston, W. Va. Chemicals and Plastics.
ANAEROBIC TREATMENT OF SYNTHETIC ORGANIC WASTES,
J. C. Hovious, J. A. Fisher, and R. A. Conway. Jan 72, 205p W72-12010, EPA-12020-DIS-01/72
Paper copy available from GPO $1.75 as EPA12010 DIS01/72.

Descriptors: (*Industrial waste treatment, *Anaerobic processes), (*Chemical industry, Industrial waste treatment), Petroleum products, Digesters, Digestion (Biology), Lagoons (Ponds), Biochemical oxygen demand, Cost estimates, Cost comparison, Aerobic processes, Pilot plants, Contractors, Process variables, Performance evaluation.
Identifiers: *Petrochemical industry, Biological industrial waste treatment, Aeration ponds.

Bench, semi-pilot, and pilot-scale studies of three anaerobic treatment processes have shown the anaerobic lagoon to be both the performance and economic choice for pretreatment of petrochemical wastes in warm, spacious locations. Semi-pilot scale studies of anaerobic contact digesters and packed-bed reactors indicated performance problems when treating actual petrochemical wastes. Experimental data from several sources were combined to prepare a design procedure for anaerobic lagoon pretreatment systems. Operation of a large (30 gpm) pilot plant consisting of anaerobic lagoons followed by aerated stabilization and facultative ponds provided a BOD removal from the petrochemical wastes of greater than 90% and a resistance to both organic-loading and pH shocks. Comparison of an anaerobic-aerobic system with a strictly aerobic system pointed out an economic advantage with the series system due to lower sludge-disposal and oxygen requirements. (Author)

PB-211 131
Oklahoma State Univ., Stillwater. Bioenvironmental Engineering Labs.
BIOLOGICAL CONCEPTS FOR DESIGN AND OPERATION OF THE ACTIVATED SLUDGE PROCESS.
Water pollution control research series,
Anthony F. Gaudy, Jr., and Elizabeth T. Gaudy. Sep 71, 156p W72-12011, EPA-17090-FQJ-09/71
Paper copy available from GPO $1.25 as EPA17090FQJ09/71.

Descriptors: (*Activated sludge process, *Reviews), (*Sewage treatment, activated sludge process), Design criteria, Biochemical oxygen demand, Dissolved organic matter, Metabolism, Kinetics, Microorganism control (Sewage), Nutrients, Aeration, Oxidation, Mathematical models.
Identifiers: Chemical oxygen demand.

Over the past decade, research has been conducted to produce a general body of conceptual principles applicable to design and operation of activated sludge processes. The aid of the report is to present these biological concepts in terms readily understood by engineering professionals. Generalized concepts of BOD exertion, the use of the measure of biologically available organic matter in a waste sample as a design and operational tool, the stoichiometry and mass balance concepts of treatment, and kinetic equations for microbial growth are presented. Design models are discussed, and a model for completely mixed reactors holding recycle solids, X (R), constant is recommended. Some guidelines for accommodation of various types of shock loadings are included. Concepts of oxidative assimilation and tmhe multiple effects of solids concentration, nitrogen concentration, and detention time are related; a new activated sludge process (continuous oxidative assimilation) for nitrogen-deficient wastes is presented. Data supporting the concept of total oxidation are presented. Some possible flow diagrams for complete aerobic treatment (purification and sludge disposal) of metabolizable organic wastes are presented.

PB-211 132
Black and Veatch, Kansas City, Mo.
ESTIMATING COSTS AND MANPOWER REQUIREMENTS FOR CONVENTIONAL WASTEWATER TREATMENT FACILITIES,
W. L. Patterson, and R. F. Banker. Oct 71, 250p W72-12012, EPA-17090-DAN-10/71
Contract EPA-14-12-462
Paper copy available from GPO $2.00 as EPA 17090 DAN 10/71.

Descriptors: (*Sewage treatment, *Economic factors), (*Manpower, Sewage treatment), Cost estimates, Operating costs, Capitalized costs, Cost comparison, Maintenance, Lagoons (Ponds), Construction costs, Sanitary engineers.
Identifiers: Aeration ponds.

Data for estimating average construction costs, operation and maintenance costs, and manpower staffing requirements, are presented for conventional wastewater treatment plants ranging from 1 to 100 mgd in capacity, and for stabilization ponds ranging from 0. 1 to 10 mgd in capacity. Estimating data are included for 21 separate components of conventional plants and 6 separate components of stabilization ponds. Examples of use of the data are given. Estimated average construction costs and operation and maintenance costs are related graphically to appropriate single parameters for respective plant components. Occupation descriptions for 24 job titles related to wastewater treatment, developed in accordance with standards of

the Dictionary of Occupational Titles, are included. The data presented provide means of estimating costs and staffing requirements for a variety of conventional wastewater treatment facilities on an average basis, but do not supplant the need for detailed study of local conditions or recognition of changing design requirements in preparing estimates for specific application. (Author)

PB-211 143
Environmetrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: ASSESSMENT DEPARTMENT.
Water pollution control research series.

Dec 71, 89p W72-12122, EPA-16110-FRU-12/71-6
Contract EPA-14-12-959
Paper copy available from GPO $0.75 as EP2.10:16110-FRU-12/71-6.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), (*Taxes, River basin development), Computerized simulation, Interactions, Gaming models, Assessments, Water resources, Water quality, Allocations, Government policies, Local government, Economic analysis, Demography, Socioeconomic status, Management planning.
Identifiers: *Property taxes, River Basin Model, Tax assessment, *Water pollution abatement.

The River Basin Model is a man-machine simulation model used to delineate the interactions taking place, within a real or hypothetical area, between the local water system and the economic, social and governmental activities of that area; it is a model of an entire regional system, with water a subsystem realistically interacting with all the other major subsystems, such as housing and transportation. The local Assessment Department is given the opportunity and responsibility for determining assessed values of property within the local dynamic system. The largest percentage of the revenues raised by local governments is from the real property tax. The value of real property in the model is determined by the normal workings of supply and demand. The Assessment Department may assess land and/or developments at any rate from zero to one hundred percent of their market value.

PB-211 144
Hydrotechnic Corp., New York.
HIGH RATE FILTRATION OF COMBINED SEWER OVERFLOWS.
Water pollution control research series,
Ross Nebolsine, Patrick J. Harvey, and Chi-Yuan Fan. Apr 72, 342p W72-12191, EPA-11023-EYI-04/72
Contract FWPCA-14-12-858
Paper copy available from GPO $2.50 as EP2.10:11023EYI04/72.

Descriptors: (*Sewage filtration, Overflows), (*Sewage treatment, Sewage filtration), (*Combined sewers, Overflows), Pilot plants, Performance evaluation, Size screening, Drum filters, Industrial wastes, Suspended sediments, Biochemical oxygen demand, Cost estimates, Operating costs, Capital costs, Field tests, Surface water runoff.
Identifiers: Storm water runoff.

Pilot plant studies were conducted to develop and demonstrate the capabilities of the deep bed, dual media, high rate filtrate treatment process for storm caused combined sewer overflows. The treatment system is comprised of a drum screen with a 40 mesh screening element (420 microns opening) followed by a deep bed, dual media, high rate filter of five feet of No. 3 anthracite (effective size 4 mm) over three feet of No. 612 Sand (effective size 2 mm). The results show suspended solids removals of 93 percent, with polyelectrolyte addition, at a filtration rate of 24 gpm/sq ft at an average influent suspended solids of 411 mg/l. Reductions in biochemical oxygen demand averaged 65 percent. Capital costs and operating costs for a high rate filtration plant are given. Principal advantages of the proposed system are: high treatment efficiencies, automated operation, and limited space requirements as compared with alternate flotation or sedimentation systems.

PB-211 145
Fuhriman, Barton and Associates, Provo, Utah.
GROUND WATER POLLUTION IN ARIZONA, CALIFORNIA, NEVADA, AND UTAH.
Water pollution control research series,
Dean K. Fuhriman, and James R. Barton. Dec 71, 255p W72-12193, EPA-16060-ERU-12/71
Paper copy available from GPO $2.00 as EP2.10:16060ERU12/71.

Descriptors: (*Ground water, *Water pollution), (*Arizona, Water pollution), (*California, Water pollution), (*Nevada, Water pollution), (*Utah, Water pollution), Salinity, Sources, Leaching, Irrigation, Brines, Aquifers, Toxicology, Nitrates, Arid land, Hydrogeology, Agricultural wastes, Injection wells, Waste disposal, Surface water runoff, Mine waters, Hydrology.
Identifiers: Brine disposal, Dissolved solids, Liquid waste disposal.

An investigation to determine the ground water pollution problems which exist in the states of Arizona, California, Nevada, and Utah was conducted. Data were obtained through an extensive review of the literature and through interviews with engineers, scientists, and governmental officials concerned with water pollution in the four states of the project area. Mineralization of ground water is the most prevalent factor in the degradation of ground water quality in the project area. Large quantities of ground water in each of the four states are undesirable for many uses because of excessive mineralization. Much of the mineralization of ground water is a result of natural processes. A listing of conditions causing ground water pollution in the project area is included.

PB-211 146
Environmetrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: PLANNING AND ZONING DEPARTMENT.
Water pollution control research series.

Dec 71, 88p W72-12123, EPA16110-FRU-12/71-11
Contract EPA-14-12-959
Paper copy available from GPO $0.75 as EP2.10:16110-FRU-12/71-11.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), (*Land use zoning, River basin development), Computerized simulation, Interactions, Gaming models, Water resources, Water quality, Allocations, Government policies, Local government, Economic analysis, Demography, Socioeconomic status, Management planning, Parks.
Identifiers: River Basin Model, *Water pollution abatement.

The River Basin Model is a man-machine simulation model used to delineate the interactions taking place, within a real or hypothetical area, between the local water system and the economic, social and governmental activities of that area; it is a model of an entire regional system, with water a subsystem realistically interacting with all the other major subsystems, such as transportation and housing. Using a gaming format, the model is a computer assisted decision-making tool. The Governmental Sector and the model required by its Planning and Zoning Department, and the computer printed output are described. A principal function of the Governmental Sector is to provide public services, and its participants are elected and appointed public officials. The Planning and Zoning Department affects land use decisions through its power of zoning; it provides adequate parkland and public institutional land (developed parkland--museums, zoos, libraries, public golf courses, etc.) for the local jurisdiction population.

PB-211 147
Environmetrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: THE TRANSPORTATION SECTOR.
Water pollution control research series.

Dec 71, 102p W72-12124, EPA-16110-FRU-12/71-14
Contract EPA-14-12-959
Paper copy available from GPO $1.00 as EP2.10:16110-FRU-12/71-14.

Descriptors: (*River basin development, Decision making), (*Regional planning, River basin development), (*Transportation, River basin development), Computerized simulation, Interactions, Gaming models, Water resources, Water quality, Allocations, Government policies, Local government, Economic analysis, Demography, Socioeconomic status, Management planning, Bus lines, Rail transportation.
Identifiers: River Basin Model, *Water pollution abatement.

The River Basin Model is a man-machine simulation model used to delineate the interactions taking place, within a real or hypothetical area, between the local water system and the economic, social and governmental activities of that area; it is a model of an entire regional system, with water a subsystem realistically interacting with all the other major subsystems, such as housing and transportation. A gaming format is employed. The Governmental Sector (provides public services) and the model required by its bus and rail companies, and the computer printed output are described. The Governmental Sector establishes the amount of transit service, sets fares, and constructs rail lines and stations. Bus and rail companies provide the population in the simulated area with transportation service to be used for the trip to full-time work only; routes and modes of travel are assigned by the computer program. A social decision-maker assigns a dollar value for a time unit spent travelling to work by the people in his control.

PB-211 159
Robert S. Kerr Water Research Center, Ada, Okla.
CHANGES IN WATER QUALITY RESULTING FROM IMPOUNDMENT.
Water Pollution Control Research Series,
William R. Duffer, and Curtis C. Harlin, Jr. Aug 71, 103p W72-12072, EPA-16080-GGH-08/71
Paper copy available from GPO $1.25.

Descriptors: (*Stream pollution, Reservoirs), (*Water quality, *Reservoirs), (*Dams, Water quality), Water analysis, Aquatic microbiology, Stratification, Temperature gradients, Seasonal variations, Dissolved gases, Oxygen, Biochemical oxygen demand, Sewage.
Identifiers: Sewage treatment effluents, Impoundments.

Changes in stream water quality, resulting from recent impoundment, are presented and discussed. Extensive data reflecting pre- and post-impoundment conditions were statistically analyzed. The extent to which pollutants influence changes in water quality was minimal, as the drainage basin was relatively undisturbed by the activities of man. Chemical, physical, and microbiological parameters at stream stations were evaluated for three discrete periods of time: prior to closure of the dam, during filling of the active conservation pool, and following filling with the surface maintained near the top of the active conservation elevation. Effects of removing treated municipal waste effluents from a tributary were also evaluated. Water quality changes within the impound-

ment were compared with respect to season, year, station location, and depth of sampling. Critical factors in the impoundment, which contributed to water quality changes, are identified. (Author)

PB-211 160
Hydroscience, Inc., Westwood, N.J.
THE EFFECT OF CHLORINATION ON SELECTED ORGANIC CHEMICALS.
Water pollution control research series,
E. L. Barnhart, and G. R. Campbell. Mar 72, 105p W72-12074, EPA-12020-EXG-03/72
Paper copy available from GPO $1.00.

Descriptors: (*Chlorination, Organic compounds), (*Sewage treatment, Chlorination), (*Chlorine organic compounds, *Biodeterioration), (*Water pollution, Chlorine organic compounds), Industrial wastes, Gas chromatography, Activated sludge process, Bioassay, Decomposition reactions, Toxicology, Alcohols, Acetone, Aromatic compounds, Phenols, Amines, Nitro compounds, Fishes, Aquatic microbiology, Biochemical oxygen demand.
Identifiers: Chemical oxygen demand, Water pollution effects (Plants), Water pollution effects (Animals).

Fourteen industrial organic chemicals were examined for their persistence through biological treatment, either as the initial compounds, or as degradation products. Semi-continuous activated sludge systems were employed. The ability of each of the chemicals to participate in reactions with free chlorine was then determined in a series of batch experiments. Certain of the test compounds formed persistent degradation products during treatment. Five of the initial compounds reacted readily with chlorine, under conditions commonly employed in effluent chlorination. Five of the chlorination products were further studied in respirometer experiments to evaluate their persistence in mixed microbial systems. Their toxicity to fish was determined using the static bioassay procedure. A series of bench scale, continuous flow ecosystems were established for the evaluation of longer term effects of three of the chlorination products. Several varieties of organisms, representing different levels in the food chain, were studied.

PB-211 161
Battelle Columbus Labs., Ohio.
FLUIDIZED-BED INCINERATION OF SELECTED CARBONACEOUS INDUSTRIAL WASTES.
Water pollution control research series.

Mar 72, 92p W72-12075, EPA-12120-FYF-03/72
Paper copy available from GPO $1.00 as EPA12120FYF03/72.

Descriptors: (*Industrial waste treatment, *Incinerators), (*Sludge disposal, Incinerators), (*Rubber industry, Industrial waste treatment), (*Textile industry, Industrial waste treatment), (*Fluidized bed processors, Incinerators), Paints, Plastics, Elastomers, Design, Air pollution, Combustion products, Cost estimates, Water pollution, Industrial wastes, Carbon, Ohio, Performance evaluation, Waste disposal, Abatement.
Identifiers: *Solid waste disposal, *Water pollution abatement, *Paint industry.

The feasibility of fluidized-bed incineration for selected carbonaceous industrial wastes was evaluated. The two-phase program consisted of an initial phase in which wastes from the paint, plastics, rubber, and textile industries in Ohio were characterized, and a second phase in which various waste samples were obtained, analyzed, and experimentally incinerated in a 10 inch diameter fluidized-bed system. Results indicate that sludges from solvent recovery operations in the paint industry, sludges from primary treatment of process wastes from plastic manufacturing, flotation sludges from primary treatment of synthetic rubber manufacture, and the waste from the viscose process of the textile industry can be incinerated in a fluidized-bed system without the production of noxious or toxic exhaust gases. The program also indicates that incineration of the various wastes significantly reduces their potential impact on stream pollution. (Author)

PB-211 164
Agricultural Research Service, Phoenix, Ariz. Water Conservation Lab.
RENOVATING SECONDARY SEWAGE BY GROUND WATER RECHARGE WITH INFILTRATION BASINS.
Water pollution control research series,
Herman Bouwer, R. C. Rice, E. D. Escarcega, and M. S. Riggs. Mar 72, 103p W72-12071, EPA-16060-DRV-03/72
Paper copy available from GPO $1.00 as EPA16060DRV03/72.

Descriptors: (*Ground water recharge, *Sewage disposal), Aquifers, Hydrology, Feasibility, Fluid infiltration, Cost estimates, Nutrients, Fluorides, Boron, Phosphorus, Nitrogen, Irrigation.
Identifiers: Sewage treatment effluent, Sewage irrigation, *Water pollution control.

A field project demonstrated the feasibility of renovating secondary sewage effluent by ground water recharge with infiltration basins. Maximum loading rates were obtained. With the schedules the system could infiltrate 300-400 ft/year using a water depth of 1 ft. Grassed basins had higher infiltration rates, and a gravel covered basin had a lower infiltration rate than a bare soil basin. Essentially complete removal of BOD and fecal coliform, and significant removal of phosphorus, nitrogen and fluoride were obtained. Hydraulic properties of the aquifer were evaluated by analog from the response of piezometric heads in the ground-water system to infiltration. These properties were then used in the design of a prototype system, which would yield renovated water at an estimated total cost of about $5 per acre-foot at the pump. (Author)

PB-211 165
Martin Marietta Corp., Baltimore, Md. Research Inst. for Advanced Studies.
SAND AND GRAVEL OVERLAY FOR CONTROL OF MERCURY IN SEDIMENTS.
Water pollution control research series,
Leonard H. Bongers, and Mohammed N. Khattak. Jan 72, 46p W72-12069, EPA-16080-HVA-01/72
Paper copy available from GPO $0.55 as EPA16080HVA01/72.

Descriptors: (*Sediments, *Mercury), (*Water pollution, Mercury), Covering, Releasing, Desorption, Control, Mercury organic compounds, Sands, Gravel, Aerobic processes, Anaerobic processes, Cost estimates, Feasibility.
Identifiers: *Water pollution control.

The release of toxic mercurials by mercury-enriched river sediments was examined in the laboratory. Tests showed a release of 1 micro g of methylmercury per sq m, per day. Methylmercury occurred in sediments with low and with high organic content, in sediments with low and high cation exchange capacity, and in aerobic and anaerobic sediments. The release of toxic mercury could be prevented by a layer of sand, 6 cm in thickness, applied over the mercury-enriched sediments. Layers of fine or coarse gravel (6 cm deep) were as effective as sand. A slow release of metallic mercury occurred in aerobic sediments. The release was much faster in anaerobic sediments. Using ascorbate as an artificial electron donor, metallic mercury could be released at high rates from aerobic sediments as well. Ascorbate appeared to be a useful indicator of divalent and biologically accessible mercury. The laboratory investigations proved the soundness of the sand blanket approach. Costs are given. (Author)

PB-211 166
California Univ., Riverside. Dept. of Soil Science and Agricultural Engineering.
NITRATE IN THE UNSATURATED ZONE UNDER AGRICULTURAL LANDS.
Water pollution control research series,
P. F. Pratt. Apr 72, 45p W72-12042, EPA-16060-DOE-04/72
Paper copy available from GPO $0.55.

Descriptors: (*Water pollution, *Nitrates), (*Ground water, Nitrates), (*Fertilizing, Water pollution), Leaching, Irrigation, Hydrology, Citrus trees, Farm crops, Concentration (Composition), Denitration, Fertilizers, Water quality, Nutrients.
Identifiers: Water pollution abatement.

Because of a tremendous increase in the concern for nitrate (NO3 (-)) in surface and ground waters, the study of NO3 (-) leaching has become very important. The present investigation was undertaken to determine the potential contribution of fertilizer N use on citrus and row crops to the NO3 (-) in ground waters in the Santa Ana River Basin of Southern California where a deep unsaturated zone exists between the soil profile or crop-root zone and the water table or saturated zone. The objectives were to relate NO3 (-) concentrations in the unsaturated zone to N inputs, N removal by harvested crops and the volume of drainage water, to obtain some estimates of transit times for drainage water through the unsaturated zone, to estimate denitrification losses on a field basis, and to assess the probable effects of present fertilizer N recommendations on NO3 (-) in ground waters.

PB-211 167
Texas Christian Univ., Fort Worth. Dept. of Biology.
INDUSTRIAL WASTES: EFFECTS ON TRINITY RIVER ECOLOGY, FORT WORTH, TEXAS.
Water pollution control research series.

Dec 71, 167p W72-12109, EPA-18050-DBB-12/71
Paper copy available from GPO $1.50 as EPA18050DBB12/71.

Descriptors: (*Water pollution, *Ecology), (*Texas, Water pollution), Bioassay, Benthos, Toxicology, Industrial wastes, Sewage, Water quality, Fishes, Minnows, Nutrients, Biochemical oxygen demand, Nitrogen, Phosphorus, Metals.
Identifiers: *Tarrant County (Texas), Trinity River, Sewage treatment effluent, *Fort Worth (Texas), Water pollution effects (Animals), Chemical oxygen demand.

Toxicity of industrial effluents discharged directly into or in close proximity to the Trinity River (Tarrant County, Texas) was investigated through a 27-month period. The investigation was concerned with four aspects--bioassay, growth and development, chemistry, and benthos. Three industries contributed toxic materials which had a significant influence on the surrounding aquatic community. Toxicity ranges were established for the respective effluents using mature minnows, fry and spawn. Effluents from a railroad equipment cleaning area, a plant producing cracking catalysts used in processing combustion engine fuels, and a sewage treatment plant influenced the water quality of the river downstream from the outfalls. The ranges of nitrates, phosphates, biochemical oxygen demand and specific conductance for the river were increased by the effluents.

PB-211 183
Westinghouse Ocean Research Lab., Annapolis, Md.
BIOLOGICAL IMPACT OF A LARGE-SCALE DESALINATION PLANT AT KEY WEST.
Water pollution control research series,
Richard H. Cheaher. Dec 71, 159p W72-12188, EPA-18080-GBX-02/71
Contract EPA-14-12-888
Paper copy available from GPO $1.25.

Descriptors: (*Desalting, Water pollution), (*Water pollution, *Marine biology), Industrial wastes, Brines, Waste disposal, Industrial water, Salinity, Heat, Copper, Metals, Toxicology, Ecology, Stratification, Effluents, Marine microorganisms, Biological surveys, Florida, Marine fishes, Barnacles, Worms, Bioassay, Biomass, Diatoms, Plankton, Photosynthesis.
Identifiers: *Water pollution effects (Animals), *Water pollution effects (Plants), *Brine disposal, Liquid waste disposal, Thermal pollution, Key West (Florida), Serpulidae.

An eighteen month biological study showed the heated brine effluent from a desalination plant in Key West, Florida caused a marked reduction in biotic diversity. Some organisms were more abundant in the receiving waters than in control areas but these were generally capable of isolating themselves from the effluent by closing up or by moving to other areas during periods of high contamination. Ionic copper, discharged from the plant, was the most toxic feature of the effluent. Temperature and salinity of the effluent and the receiving water were such that the effluent stratified at the bottom of the receiving basin. Periodically, the plant shut down for maintenance or cleaning. When it resumed operations, low temperature water of ambient salinity was discharged which was highly contaminated with ionic copper. These sudden effusions caused more biological damage than steady-state conditions. At the end of the study, extensive engineering changes were made to correct corrosion problems and lower copper discharge. (Author)

PB-211 184
Pulp Manufacturers Research League, Appleton, Wis.
REVERSE OSMOSIS CONCENTRATION OF DILUTE PULP AND PAPER EFFLUENTS.
Water pollution control research series,
Averill J. Wiley, George A. Dubey, and I. K. Bansal. Feb 72, 369p W72-12189, EPA-12040-EEL-02/72
Prepared in cooperation with Institute of Paper Chemistry, Appleton, Wis.
Paper copy available from GPO $2.75.

Descriptors: (*Industrial waste treatment, *Osmosis), (*Paper industry, Industrial waste treatment), Performance evaluation, Spent liquors (Pulping), Suspended sediments, Flux (Rate), Maintainability, Pilot plants, Fouling, Cost estimates, Concentrating, Water reclamation, Industrial wastes, Design criteria, Calcium.
Identifiers: *Reverse osmosis, *Water pollution control, Tubular membranes, Spiral wound membranes, Hollow tube membranes, Waste water reuse.

Adaptation of reverse osmosis (RO) as a method of concentration for dilute effluents of pulping, bleaching, and paper manufacture was conducted in laboratory, pilot scale, and in large 50,000 gallon per day field demonstrations at pulp mills. Most of these dilute wastes at 1 percent solids contained suspended particles, colloidal suspensoids, large molecular-weight wood derived organics, and/or scale-forming inorganic chemical residues. Tubular membrane systems capable of being operated at self-cleaning velocities increasing beyond 2.0 feet per second, as concentration advanced to 10 percent solids, were apparently best adapted to processing these effluents at sustained high flux rates and relatively free of fouling problems. Capillary fiber and spiral wound sheet membrane systems required expensive clarification treatment. Tubular systems studied were subject to excessive failure rates in terms of life of membrane support structures or to leakage of internal connections based on the support structure. (Author)

PB-211 185
Minnesota Univ., Minneapolis. School of Public Health.
LAKE SUPERIOR PERIPHYTON IN RELATION TO WATER QUALITY.
Water pollution control research series,
Theodore A. Olson, and Thoren O. Odlaug. Feb 72, 269p W72-12192, EPA-18050-DBM-02/72
Paper copy available from GPO $2.00.

Descriptors: (*Aquatic microbiology, *Great Lakes), (*Biological surveys, Great Lakes), Primary biological productivity, Limnology, Ecology, Nutrients, Luminous intensity, Substrates, Rocks, Algae, Photosynthesis, Chlorophyll, Diatoms, Chrysophyta, Chlorophyta, Cyanophyta, Water quality.
Identifiers: *Periphyton, *Lake Superior.

Laboratory and field studies were conducted to evaluate the importance of periphyton in western Lake Superior with special reference to the make-up and distribution of the periphyton growths and to the overall importance of productive capacity of this assemblage of organisms. The taxonomic portion of the investigation indicated that over 90% of the total number of organisms were diatoms and that the phyla to which these diatoms belonged were the Chrysophyta, the Chlorophyta, and the Cyanophyta. Predominant genera were Synedra, Achnanthes, Navicula, Cymbella, and Gomphonema. In many respects, the periphyton of Lake Superior was similar to that found in streams and there was evidence that the interrelated factors that affected periphyton growths were temperature, light intensity, depth of water, water movements, nutrient levels, and the type of substrate. (Author)

PB-211 186
Randolph-Macon Woman's Coll., Lynchburg, Va.
ISOLATION OF LYTIC AGENTS RELATED TO SPHAEROTILUS,
Dorothy J. Geason. Sep 70, 26p W72-12120, FWPCA-17050-DHI-09/70

Descriptors: (*Sphaerotilus, Bacteriocides), (*Aquatic microbiology, Sphaerotilus), (*Ecology, Sphaerotilus), Water quality, Sewage, Aerobic bacteria, Rivers, Myxococcaceae, Water pollution.
Identifiers: *Lysis, Bdellovibrio bacteriovorus, Sporocytophaga, Water pollution effects (Plants).

The study has been undertaken to isolate and identify those agents found in nature which are capable of lysing Sphaerotilus and thus abate the nuisance associated with its occurrence in flowing streams and raw sewage. Enrichment culture of river water or raw sewage and either a locally isolated strain or ATCC 13336 has resulted in the isolation of four bacteria capable of destroying the cells but not the sheath of Sphaerotilus. Bdellovibrio bacteriovorus first appeared as small motile rods causing spheroplasting and lysis of the host. Two other isolates were gram-negative rods which formed microcysts but not fruiting bodies. These have been tentatively identified as myxobacters of the genus Sporocytophaga. The fourth isolate is also a gram-negative rod.

PB-211 191
Cecil (Lawrence K.) Tucson, Ariz.
EVALUATION OF PROCESSES AVAILABLE FOR REMOVAL OF PHOSPHORUS FROM WASTEWATER.

Oct 71, 44p* W72-12121, EPA-R2-72-034
Contract FWQA-14-12-581

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Precipitation (Chemistry), Phosphorus), (*Sewage treatment, Chemical removal (Sewage treatment)), Phosphates, Sludge disposal, Performance evaluation, Cost estimates, Calcium oxides, Aluminum sulfate, Iron sulfate, Electrochemistry, Solubility, Sludge digestion, Aerobic processes, Sludge drying, Activated sludge process, Digestion (Decomposition), Capital costs, Operating costs, Incinerators.
Identifiers: Tertiary sewage treatment.

The more important treatment processes for removal of phosphorus compounds from municipal wastewater are evaluated for practicality, cost, and impact on the quality of the treated effluent. The numerous options for the designer in the selection of treating processes, chemicals to be used, and the point or points of chemical application are discussed. A detailed list of phosphorus removal projects of one consulting engineer is given as an example of phosphorus removal projects under design. A list of full-scale phosphorus removal plants, already in operation or planned, shows the type of treatment selected and the operating results expected. Various methods of ultimate sludge disposal are discussed. (Author)

PB-211 215
TraDet, Inc., Columbus, Ohio.
THE ADAPTATION OF THE GOLD AMALGAMATION SAMPLING AND ANALYTICAL PROCEDURE FOR THE ANALYSIS OF MERCURY IN STACK GASES TO HIGH SO2 ENVIRONMENTS OBSERVED IN SMELTERS,
G. William Kalb. 30 Jun 72, 30p*
Contract EPA-68-02-0341
See also PB-210 817.

Descriptors: (*Mercury, *Gas sampling), (*Air pollution, Mercury), Flue gases, Field tests, Smelters, Zinc, Errors, Sulfur dioxide, Spectrochemical analysis, Atomic spectroscopy, Mercury amalgams, Gold alloys, Trace elements, Gas analysis, Metal industry.
Identifiers: *Air pollution detection, Zinc industry.

The research described concerns field tests for the adaption of the gold amalgamation sampling procedure for the collection of mercury in gas streams having high SO2 concentrations. This method, which was described in PB-210 817, consists of removing volatile mercury from the gas stream by amalgamating it on gold foil. The gold amalgam sampling and analytical procedure developed for power plants was directly amenable to the zinc smelter investigated. SO2 concentrations as high as 7.5% did not affect the sampling and analytical procedure. When using a stannous chloride or distilled water scrubber during one minute runs over a wide range of flow rates reproducible results were obtained with a 95% plus recovery on the first amalgamator. The stability of the mercury-gold amalgam depends on the temperature of the gas stream. The major problem was the high sensitivity of the analytical procedure resulting in a very short sampling period. (Author)

PB-211 235
General Electric Co., Philadelphia, Pa. Re-entry and Environmental Systems Div.
STUDY OF AIR POLLUTION ASPECTS OF VARIOUS ROADWAY CONFIGURATIONS.
Final rept.

1 Sep 71, 211p* APTD-1146
Contract CPA-22-69-135

Descriptors: (*Air pollution, *Exhaust gases), (*Highway planning, Air pollution), (*Urban areas, Air pollution), Atmospheric diffusion, Mathematical models, Design criteria, Streets, Concentration (Composition), Carbon monoxide, Particles, Oxidizers, Nitrogen oxides, Standards, New York, Diurinal variations, Wind (Meteorology).
Identifiers: *Automobile exhaust, Clean Air Act 1970, New York City (New York), Air pollution standards.

The experimental study was undertaken to: Ascertain the current air quality in the immediate vicinity of various urban roadway configurations; Determine how the selected urban roadway configurations aid or hinder the diffusion of the pollutants emitted by urban traffic; and Develop mathematical relationships between traffic, traffic speed, pollutant concentration, meteorological parameters and roadway configuration. It is possi-

ble for urban and transportation planners to compute in advance the pollution anticipated for a proposed roadway design in order to insure that dwellings adjacent to the proposed design will not be exposed to pollutant concentrations in excess of the National Air Quality Standards. Ten urban roadway configurations were evaluated: Covered on top-open at side; Long tunnel (ventilated; Shallow cut; Short tunnel (unventilated); Deep cut; Grade road; Cantilever cover; Viaduct; City street; and Intermittent span. All of the testing locations were in New York City.

PB-211 240
District of Columbia Dept. of Sanitary Engineering, Washington.
FULL-SCALE RAW WASTEWATER FLOCCULATION WITH POLYMERS.
Water pollution control research series,
Paul V. Freese, and Edward Hicks. Nov 70, 56p* W72-12073, EPA-17050-EJB-11/70
Grant FWPCA-WPRD-53-01-67
Paper copy also available from GPO $0.60 as EPA17050EJB11/70.

Descriptors: (*Sewage treatment, *Flocculating), (*Flocculants, *Polyelectrolytes), Polymers, Sedimentation, Precipitation (Chemistry), Performance evaluation, Optimization, Suspended sediments, Elutriation, Sludge disposal, Biochemical oxygen demand.

High molecular-weight organic polyelectrolytes (polymers) have been used successfully to flocculate raw wastewater and to increase the removal of pollutants from the wastewater during primary sedimentation. At present, however, a satisfactory method for predicting the effectiveness of a particular polymer for flocculating solids in a specific wastewater is not available. Three polymers, Dow's anionic A-21 modified with cationic C-31, Hercules' cationic Reten 210, and Calgon's anionic ST 269 with a clay builder, were added to raw wastewater in 240 MGD tests of raw wastewater flocculation. The objectives of polymer flocculation of the raw wastewater were to increase solid capture in the primary tanks, reduce the BOD load to aeration, and permit recycle of the elutriate to the plant's influent. Polymer treatment of raw wastewater did not improve the solids capture in elutriation or permit continuous elutriate recycle.

PB-211 242
Oklahoma Agricultural Experiment Station, Stillwater.
EVALUATION OF BEEF CATTLE FEEDLOT WASTE MANAGEMENT ALTERNATIVES.
Water Pollution Control Research Series,
A. F. Butchbaker, J. E. Garton, G. W. A. Mahoney, and M. D. Paine. Nov 71, 340p EPA-13040-FXG-11/71, W72-12278
Paper copy available from GPO $2.50 as EP2.10:13040FXG11/71.

Descriptors: (*Livestock, Agricultural wastes), (*Agricultural wastes, *Industrial waste treatment), (*Waste disposal, Agricultural wastes), Economic analysis, Cost estimates, Agricultural engineering, Handling equipment, Surface water runoff, Lagoons (Ponds), Hydrology, Sewage treatment, Aerobic processes, Anaerobic processes, Irrigation, Incinerators, Site surveys, Design criteria, Water pollution.
Identifiers: *Water pollution control, *Feedlot wastes, Manure, Aeration ponds, Anaerobic lagoons, Solid waste disposal, Liquid waste disposal, Sewage irrigation.

Alternative beef waste management systems were examined to determine minimum cost systems for effective waste disposal. Design and cost information was obtained from feedlot visits and the literature. A computer program was developed for use with a Conversational Programming System (CPS) for calculating the sizes of equipment and facilities and for estimating the facility and machinery operating and investment costs. For open feedlots, two waste management systems, solid and runoff-carried, were considered. Costs are given. Confinement buildings with slotted floors using slurry handling methods or with solid floors using solid handling methods offer a high potential for completely controlling the animal waste and abating pollution. A promising system for near optimum pollution control is a cable scraper system underneath a slotted floor for daily removal and disposal of the wastes. A manure irrigation is discussed.

PB-211 243
Ionics, Inc., Watertown, Mass.
HYPOCHLORITE GENERATOR FOR TREATMENT OF COMBINED SEWER OVERFLOWS.
Water pollution control research series.

Mar 72, 91p W72-12280, EPA-11023-DAA-03/72
Contract FWPCA-14-12-490
Paper copy available from GPO $1.00 as EP2.10:11023DAA 03/72.

Descriptors: (*Hypochlorites, Production), (*Sewage treatment, *Disinfection), (*Electrolytic cells, Hypochlorites), Overflows, Sodium hypochlorites, Gas generators, Salt water, Chlorine, Chlorination, Sodium hydroxide, Ion exchange resines, Performance evaluation, Cost estimates, Combined sewers, Design criteria.
Identifiers: Storm water runoff.

An advanced electrolytic generator has been developed for on-site production of sodium hypochlorite for disinfection of overflows from combined sewer systems. In the system an electrochemical cell electrolyzes sodium chloride brine to chlorine gas and sodium hydroxide solution, which are reacted immediately outside the cell to produce a 5 to 10% sodium hypochlorite solution. Significant advances in safety and economy have been realized by use of a hydraulically impermeable cation exchange membrane. The most critical components, the dimensionally stable anode and the ion-exchange membrane, have both operated for over 3000 hours with no deterioration of performance. System operation has been given a first order economic optimization. The cost is significantly below that of truck delivered solution. Such economy of operation should make the generator useful for a wide variety of water treatment applications. (Author)

PB-211 244
Research Triangle Inst., Durham, N.C. Environmental Studies Center.
FILTRATION OF MUNICIPAL WASTE WITH A MOVING BED CONTACTOR.
Water pollution control research series,
F. O. Mixon. Jan 72, 51p W72-12281, EPA-17030-FWH-01/72
Contract FWPCA-14-12-895
Paper copy available from GPO $0.60 as EP2.10: 17030 FWH 01/72.

Descriptors: (*Sewage filtration, *Contactors), (*Sewage treatment, Sewage filtration), Performance evaluation, Trickling filtration, Suspended sediments, Cost estimates, Capital costs, Operating costs, Coagulation.
Identifiers: Moving bed contactor filtration.

A novel moving bed contactor has been used in filtration studies of municipal waste at various stages within a trickling filter plant. Granular, buoyant filter medium is slurried with process feed and introduced to the bottom of a column equipped with lateral retaining screens and filter medium harvesting machinery, both positioned toward the top of the column. Within the column, filter medium rises by buoyancy and forms a porous plug that traps suspended solids from the feed stream. Filtered liquid is removed from the lateral screen, and soiled filter medium is continuously removed from the column top, washed and recycled to the column bottom. The process operates stably and dependably on all feeds tested--raw wastewater, primary clarifier effluent, [illegible]ckling filter effluent. Filtration of alum-coagulated feed is less effective than that of untreated feed. Costs of the process, including equipment, power, construction, and amortization, were estimated. (Author)

PB-211 245
North Carolina State Univ., Raleigh. Dept. of Textile Chemistry.
WATER POLLUTION REDUCTION THROUGH RECOVERY OF DESIZING WASTES.
Water pollution control research series,
Carl E. Bryan. Jan 72, 50p W72-12282, EPA-WQO-12090-EOE-01/72
Paper copy available from GPO $0.60 as EP2.10:12060-EOE-01/72.

Descriptors: (*Textile industry, *Industrial waste treatment), (*Sizing materials, Industrial waste treatment), Performance evaluation, Carboxymethyl cellulose, Polyvinyl alcohol, Biochemical oxygen demand, Precipitation (Chemistry), Coagulation, Cost estimates, Water pollution, Activated sludge process, Aluminum sulfate, Alums.
Identifiers: *Water pollution control, Biochemical industrial waste treatment.

Removal of the size with which the warp (lengthwise) yarns are coated to make the weaving of the fabric possible is a common operation in the preparation of cloth for dyeing and finishing. Processes for precipitating from desizing wastes the synthetic warp sizes, carboxymethyl cellulose (CMC) and polyvinyl alcohol (PVA), were investigated. Cycles of sizing, desizing and size recovery were performed on cotton-polyester (65:35) yarns, starting with commercial CMC, and continuing with only the recovered material. Two copolymers of PVA were prepared, one of which was precipitated from dilute solution by aluminum sulfate and ferric chloride, the other by acidification. Evidence was obtained that acclimatization of sewage bacteria to CMC and PVA occurs upon prolonged contact in a laboratory activated-sludge unit. Costs are discussed.

PB-211 246
Midwest Research Inst., Kansas City, Mo.
DEVELOPMENT OF TECHNIQUES FOR ESTIMATING THE BACTERIAL POPULATION OF SEWAGE SLUDGE.
Water pollution control research series,
William Spangler, and Walter Langston. Dec 70, 89p W72-12283, EPA-WQO-17070-DRP-12/70
Contract FWPCA-14-12-569
Paper copy available from GPO $1.00 as EP2.10:17070-DRP-12/70.

Descriptors: (*Sludge, *Biomass), (*Anaerobic bacteria, Counting), (*Sewage treatment, Anaerobic bacteria), Anaerobic processes, Sludge digestion, Methane, Performance evaluation, Culture media, Sampling, Microbiology.
Identifiers: Methane bacteria.

The research program was initiated to develop practical methods for evaluation of the biomass in anaerobic sewage sludge and to determine if predictions could be made concerning digester performance. Sampling and handling methods were improved and standardized to give maximum anaerobic counts. A simplified technique for growing obligate anaerobes that can be safely performed by technicians with minimum training in bacteriology was developed. Anaerobic media were improved to yield as high or higher counts of methanogenic bacteria than heretofore reported. A simple freeze-dry technique was developed for preparation of consistent batches of sludge supernatant used in media as a supplement for growth of obligate sludge anaerobes. The possible relationship between concentration of a growth factor required by Methanobacterium ruminantium (used to evaluate potency of growth factor extracted) and digester efficiency could have important practical implications. (Author)

PB-211 250
Advanced Technology Center, Inc., Dallas, Tex.
MERCURY POLLUTION CONTROL IN STREAM AND LAKE SEDIMENTS.
Water pollution control research series,
J. D. Suggs, D. H. Petersen, and J. B. Middlebrook, Jr. Mar 72, 39p* W72-12070, EPA-16080-HTD-03/72
Contract EPA-68-01-0086
Paper copy also available from GPO $0.50 as EPA-16080-HTD-03-72.

Descriptors: (*Water pollution, Mercury), (*Mercury, *Chemisorption), (*Water chemistry, Mercury), (*Sediments, Mercury), Precipitation (Chemistry), Mercury organic compounds, Mercury inorganic compounds, Adsorption, Thiols, Polyvinyl alcohol, Substrates, Performance evaluation, Thioureas, Cotton fabrics, pH, Dissolved gases, Oxygen.
Identifiers: *Water pollution control.

Mercury contamination enters streams and lakes from a variety of sources. It becomes sorbed onto the sediments where it resides in dynamic equilibrium with the dissolved species in the suprajacent water column. A means must be found to remove mercury from sediments without destroying the environment or otherwise upsetting the ecological balance. The problem of mercury immobilization and removal was addressed by evaluating a number of recoverable sulfur based getter systems. Examples of these are: Elemental sulfur deployed as a coating on a recoverable meshwork, and Thiourea type organic compounds dispersed in a recoverable matrix. In the course of these evaluations several improved getter system combinations became obvious and these were also included into the scope of this research. Only natural sediments and waters were used to prepare test aquaria in order to simulate natural conditions as nearly as possible.

PB-211 255
Missouri River Basin Animal Waste Management Pilot (Steering) Task Group, Kansas City.
FEEDLOT WASTE MANAGEMENT. WHY AND HOW.
Final rept.

Jun 71, 50p

Descriptors: (*Water pollution, *Agricultural wastes), (*Beef cattle, Agricultural wastes), Reviews, Agricultural engineering, Surface water runoff, Ground water, Air pollution, Dust control, Odor control, Biodeterioration, Site surveys, Management, Lagoons (Ponds), State government, Regulations.
Identifiers: *Feedlot wastes, Manure, *Water pollution control.

Basic information on the problem of beef cattle feedlot waste management and the pollution arising from these operations is presented in a non-technical manner. The factors that cause feedlots to pollute and the magnitudes pollutants may reach are discussed along with some management factors and structural and mechanical means to help control water pollution. Sources of technical and financial assistance in design and layout of control facilities and the water pollution control agencies for the ten Missouri River Basin states are listed. Existing animal waste control regulations are also furnished for these ten states.

PB-211 256
West Virginia Univ., Morgantown. Dept. of Chemical Engineering.
SOLID WASTE: A NEW NATURAL RESOURCE.

May 71, 18p

Descriptors: (*Refuse disposal, *Fluidized bed processing), (*Waste disposal, Fluidized bed processing), (*Pyrolysis, Waste disposal), (*Manufactured gas, Waste disposal), Sand, Design, Cellulose, Fuels, Performance evaluation, Utilization.
Identifiers: *Solid waste disposal, *Pyrolysis incineration.

An experimental program is described for converting municipal refuse into fuel gas of high thermal efficiency using the fluidized bed pyrolysis process. The process uses fluidized sand in the absence of oxygen to allow the production of a fuel gas and char. A short description of a pilot test is given.

PB-211 264
Rocketdyne, Canoga Park, Calif.
COMPUTERIZED DESIGN AND COST ESTIMATION FOR MULTIPLE-HEARTH SLUDGE INCINERATORS.
Water pollution control research series,
Walter Unterberg, George R. Schneider, and R. J. Sherwood. Jul 71, 170p W72-12279, EPA-17070-EBP-07/71
Contract PH-14-12-547
Paper copy available from GPO $1.50 as EP2.10:17070-EBP-07/71.

Descriptors: (*Sludge disposal, Incinerators), (*Openhearth furnaces, Sludge disposal), (*Incinerators, Computerized simulation), Design criteria, Computer programs, Waste disposal, Cost estimates, Fuel consumption, Labor estimates, Heat balance, Combustion products, Scrubbers, Air pollution control equipment, Furnaces, Capital costs, Operating costs.
Identifiers: *Solid waste disposal.

A digital computer program was developed for the preliminary design and cost estimation of an optimum multiple-hearth-furnace system for sewage sludge incineration. The program was primarily based on field data from nine operating plants, each having one to four furnaces. The individual furnaces covered a range in capacity from 200 to 4500 lb dry solids per hours. Operating schedules and thermal cycling were considered, and costs were normalized to 1969 dollars. The computer program provides the number, dimensions and ratings of components; expenditures of labor, fuel and power; and all the cost elements for an incineration system which is to process a given flow of sludge having specified characteristics. Cost breakdowns are calculated for capital, total cost per annum and total cost per ton dry solids incinerated. The computer program may also be used for the thermal analysis of a multiple-hearth furnace incinerator without design and cost features.

PB-211 265
Southwest Research Inst., Houston, Tex.
COLLABORATIVE STUDY OF REFERENCE METHOD FOR THE CONTINUOUS MEASUREMENT OF CARBON MONOXIDE IN THE ATMOSPHERE (NON-DISPERSIVE INFRARED SPECTROMETRY),
Herbert C. McKee, and Ralph E. Childers. May 72, 48p
Contract CPA-70-40

Descriptors: (*Carbon monoxide, *Gas detectors), (*Air pollution, Carbon monoxide), Infrared spectra, Monitors, Spectroscopic analysis, Laboratories, Statistical analysis, Calibration, Standards, Errors, Humidity, Precision, Accuracy.
Identifiers: *Air pollution detection.

Information obtained in the evaluation and collaborative testing of a reference method for measuring the carbon monoxide content of the atmosphere is presented. The method is based on the infrared absorption characteristics of carbon monoxide, using an instrument calibrated with gas mixtures containing known concentrations of carbon monoxide. The method as published in the appended 'Federal Register' article was tested by means of a collaborative test involving a total of 16 laboratories. The test involved the analysis of both dry and humidified mixtures of carbon monoxide and air over the concentration range from 0 to 60 mg/cu m. A statistical analysis of the data of 15 laboratories is presented. (Author)

PB-211 275
Oregon State Univ., Corvallis. Dept. of Oceanography.
OCEANOGRAPHY OF THE NEARSHORE COASTAL WATERS OF THE PACIFIC NORTHWEST RELATING TO POSSIBLE POLLUTION. VOLUME I.

Jul 71, 629p W72-12190-Vol-1, EPA-WQO-16070-EOK-07/71
See also Volume 2, PB-211 276.
Paper copy available from GPO $5.25 as stock number 5501-0140.

Descriptors: (*Oceanographic data, *Coasts), (*Water pollution, *Oceans), (*Electric power plants, Coasts), Pacific Ocean, Geology, Hydrology, Salinity, Heat budget, Ocean currents, Cooling water, Industrial wastes, Plumes, Dissolved gases, Carbon dioxide, Paper industry, Trace elements, Metals, Marine biology, Ecology, Heat, Biological surveys, Washington (State), Oregon, California, Radioactive isotopes, Reviews.
Identifiers: Pacific Northwest, Thermal pollution, Water pollution effects (Animals), Water pollution effects (Plants).

To answer the environmental questions posed by use of the nearshore area for industrial outfalls, a coastal pollution group was formed to collect, organize, and analyze all oceanographic data which would aid in the evaluation of sites for industrial outfalls on the open coast of the Pacific Northwest. Part I of the report presents a discussion of the physical and geological factors which are known for the region of study. Part II summarizes the knowledge of the chemistry and radiochemistry of the region, and Part III considers the biological aspects with emphasis on temperature relations and attempts to establish some preliminary priorities. Part IV is an attempt to describe the coastal ecosystem by integrating the physical, chemical, geological, and biological information into a general overview. A bibliography with over 3100 references is given.

PB-211 276
Oregon State Univ., Corvallis. Dept. of Oceanography.
OCEANOGRAPHY OF THE NEARSHORE COASTAL WATERS OF THE PACIFIC NORTHWEST RELATING TO POSSIBLE POLLUTION. VOLUME II.

Jul 71, 491p W72-12190-Vol-2, EPA-WQO-16070-EOK-07/71
See also Volume 1, PB-211 275.
Paper copy available from GPO $6.00 as stock number 5501-0141.

Descriptors: (*Oceanographic data, *Coasts), (*Water pollution, *Oceans), (*Electric power plants, Coasts), Reviews, Pacific Ocean, Wind (Meteorology), Salinity, Ocean waves, Trace elements, Metals, Toxicology, Pesticides, Dissolved gases, Oxygen, pH, Nutrients, Radioactive isotopes, Aquatic plants, Aquatic animals.
Identifiers: Pacific Northwest, Water pollution effects (Animals).

The report is an appendix to oceanographic study of the Pacific Northwest coastal waters as related to future pollution from power plant discharges. The topics presented include wind data; temperature and salinity data; trace metals and their toxicities; pesticide toxicities; oxygen, nutrient, and pH data; Radionucleotides; and an annotated checklist of plants and animals (includes more than 4400 species).

PB-211 280
Battelle Columbus Labs., Ohio.

MULTIDIRECTIONAL TURBULENCE PROBE DEVELOPMENT. PHASE I. UNIDIRECTIONAL TURBULENCE SENSOR DEVELOPMENT.
Water pollution control research series,
Thomas Atterbury, James E. Sorenson, and Jack J. Groom. Oct 71, 66p W72-12453, EPA-16050-DOW-10/71
Contract EPA-14-12-827
Paper copy available from GPO $0.65 as EPA16050DOW10/71.

Descriptors: (*Detectors, Development), (*Water pollution, Monitors), Probes, Turbulence, Velocity, Frequency, Depth, Strain gages, Pressure sensors, Diaphragms (Mechanics).
Identifiers: *Turbulence probes.

Development of a unidirectional-turbulence probe was undertaken to investigate the feasibility of a small-diameter strain-gaged diaphragm-type pressure transducer and a self-adjusting depth compensation air reservoir for use in the follow-on development of a small (1/2-inch diameter) multidirectional-turbulence probe. A unidirectional probe was developed which is capable of monitoring water velocities over a range of 0.5 to 5 ft/sec in turbulence frequencies of 0 to over 100 Hertz and which will automatically operate in water up to 10-feet deep. Sealing inadequacies in both the air reservoir membrane and the pressure diaphragm permit moisture entry into the air volume covering the strain gages. This has given rise to balance drift and circuitry ground problems that have resulted in the placing of limitations on the water exposure and turbulence monitoring times for the unidirectional probe. These problems also suggested that the concepts cannot be immediately incorporated into a multidirectional probe design. (Author)

PB-211 282
Tulane Univ., New Orleans, La.
SEWER BEDDING AND INFILTRATION, GULF COAST AREA.
Water pollution control research series,
John K. Mayer, Frank W. Macdonald, and Stephen E. Steimle. May 72, 172p W72-12394, EPA-11022-DEI-05/72
Contract EPA-80-04-68
Paper copy available from GPO $1.50 as EP2.10:11022DEI05/72.

Descriptors: (*Sewers, Fluid infiltration), Sanitary sewers, Ground water, Construction materials, Sanitary engineering, Cost estimates, Maintenance, Louisiana.
Identifiers: New Orleans (Louisiana), Gulf Coast Region (United States).

Ground water infiltration studies were performed on several sewer systems in 1962-63 and again in 1970 and the results were compared. Infiltration measurements in the systems ranged from zero to 111,560 gallons per inch of diameter per mile per day. The infiltration was slightly increased in some lines and was greatly decreased in others. The decrease is attributed to soil and grease clogging the breaks, as was observed in subsequent television inspection. Infiltration has been found to vary with time. The high infiltration rates were attributed to poor construction methods used by contractors on the main sewer system and by plumbers on house connections. Bedding and backfill material should provide even distribution of load and support for the pipe. The use of these materials and other construction techniques are described.

PB-211 283
United Aircraft Research Labs., East Hartford, Conn.
ADVANCED NONTHERMALLY POLLUTING GAS TURBINES IN UTILITY APPLICATIONS.
Water pollution control research series.

Mar 71, 270p W7212450, EPA-16130-DNE (03/71)
Contract EPA-14-12-593
Paper copy available from GPO $2.00 as EP2.10:16130DNE03/71.

Descriptors: (*Gas turbine power generation, *Reviews), Performance evaluation, Forecasting, Cost estimates, Electric power generation, Comparison, Thermal power plants, Natural gas, Electric utilities, Capital costs, Operating costs, Industrial water, Cooling water, Heat, Water pollution, Abatement.
Identifiers: Thermal pollution, Water pollution abatement.

Performance, size and cost for advanced simple-, regenerative-, and compound-cycle gas turbine engines were reviewed. For various regions of the U.S., comparisons were made of installed costs and total busbar power costs of a 1000-MW power station using gas turbines versus one using steam turbines. It is shown that the gas turbines in the 1970 decade could produce electric power at lower costs than steam turbines in the South Central U.S. where natural gas is readily available. Elsewhere in the U.S. the gas turbines would be economically competitive if moderately priced clean fuels were available. Advanced gas turbines are expected to become more competitive in the 1980's as anticipated increases in turbine inlet temperature, component efficiencies and larger engine designs lead to more efficient and lower cost engines. Although the development costs for large, advanced gas turbines would approach 100 to 200 million dollars, the total amount that utilities are expected to expend for cooling devices to combat thermal pollution over the next two decades is more than ten times this amount. (Author)

PB-211 284
National Center for Research and Training in the Hydrologic and Hydraulic Aspects of Water Pollution Control, Nashville, Tenn.
HEATED SURFACE JET DISCHARGED INTO A FLOWING AMBIENT STREAM.
Water pollution control research series,
Louis H. Motz, and Barry A. Benedict. Mar 71, 219p W72-12451, EPA-16130-FDQ-03/71
Prepared in cooperation with Vanderbilt Univ., Nashville, Tenn.

Descriptors: (*Stream pollution, Mixing), (*Water pollution, Heat), (*Stream flow, Heat), Plumes, Jet mixing flow, Drag, Entrainment, Cooling water, Industrial wastes, Electric power plants, Stratification, Turbulent flow, Site surveys, Mathematical models, Hydraulic models.
Identifiers: *Thermal pollution.

The temperature distribution in the water body due to a discharge of waste heat from a thermal-electrical plant is a function of the hydrodynamic variables of the discharge and the receiving water body. The temperature distribution can be described in terms of a surface jet discharging at some initial angle to the ambient flow and being deflected downstream by the momentum of the ambient velocity. It is assumed that in the vicinity of the surface jet, heat loss to the atmosphere is negligible. It is concluded that the application of the two dimensional surface jet model is dependent on the velocity ratio and the initial angle of discharge, and the value of the initial Richardson number, as low as 0.22. Both laboratory and field data are used for verification of the model which has been developed. Laboratory data were used to evaluate the two needed coefficients, a drag coefficient and an entrainment coefficient, as well as the length of the zone of flow establishment and the angle at the end of that zone.

PB-211 285
Minnesota Univ., Minneapolis. St. Anthony Falls Hydraulic Lab.
SURFACE DISCHARGE ON HEATED WATER,
H. Stefan, N. Hayakawa, and F. R. Schiebe. Dec 71, 255p W72-12452, EPA-16130-FSU-12/71
Paper copy available from GPO $2.00 as EP2.10:16130 FSU 12/71.

Descriptors: (*Stream pollution, Mixing), (*Water pollution, Heat), (*Stream flow, Heat), Plumes, Outfall sewers, Hydraulic models, Hydrodynamics, Mathematical models, Heat balance, Computer programs, Site surveys, Cooling water, Electric power plants, Field tests, FORTRAN.
Identifiers: *Thermal pollution.

A comprehensive analytical model has been developed to describe the flow of heated water from a channel onto the surface of a lake or reservoir. This analytical tool can be used to predict depth, width, temperature, and flow velocity in a heated water surface jet. Weak cross-currents and winds are included. The model also predicts the total amount of heat actually lost to the atmosphere and the amount of ambient water entrained. As presented, the analytical method is simple and inexpensive to apply. It assumes fully established buoyant jet flow into homogeneous environment. It can be extended to include, for example, an outlet zone (zone of flow establishment) or stratification in the ambient water. Criteria for the existence of the two-dimensional mixing internal hydraulic jump and the rates of entrainment which it may produce have been established theoretically and verified with a limited number of experimental data. The results of two field surveys in a thermal plume are presented. (Author)

PB-211 298
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
DENSITY INDUCED MIXING IN CONFINED AQUIFERS.
Water pollution control research series,
L. W. Gelhar, J. L. Wilson, J. S. Miller, and J. M. Hamrick. Mar 72, 131p W72-12041, EPA-16060-ELJ-03/72
Paper copy available from GPO $1.25 as EP2.10:16060 ELJ 03/72.

Descriptors: (*Aquifers, *Water pollution), (*Injection wells, Hydrology), (*Waste disposal, Injection wells), Mixing, Mathematical models, Stratification, Artesian water, Tests, Water flow.
Identifiers: *Liquid waste disposal.

Analytical techniques are given to describe the mixing of two fluids of different density in a confined aquifer, in which one fluid is introduced to the aquifer by well recharge. The immiscible displacement process in both linear and radial flows is analyzed and the effects of longitudinal and lateral dispersion are included using a boundary layer approximation. Hydrodynamic dispersion retards gravity segregation due to density differences. During recharge excellent agreement between the theoretical predictions and experimental results was found, and the predicted retarding effects of longitudinal dispersion were verified. During withdrawal some systematic differences between the theory and observation were noted. Theoretical predictions of recovery efficiency during a recharge-storage-withdrawal sequence show trends similar to those observed. Direct theoretical predictions of recovery efficiency during single or multiple sequences of recharge-storage-withdrawal were developed for an immiscible system, and similar developments outlined for miscible displacement.

PB-211 316
Alaska Univ., College. Inst. of Water Resources.
INTERNATIONAL SYMPOSIUM ON WATER POLLUTION CONTROL IN COLD CLIMATES HELD AT THE UNIVERSITY OF ALASKA, ON 22-24 JUL 1970.
Water pollution control research series,
R. Sage Murphy, David Nyquist, and Paul W. Neff. Jul 70, 341p W72-12548, EPA-16100-EXH-11/71
Paper copy available from GPO $2.50 as stock no. 5501-0208 and as EP2.10:16100EXH11/71.

Descriptors: (*Water pollution, Arctic regions), (*Limnology, *Arctic regions), (*Sewage treatment, Arctic regions), Meetings, Industrial wastes, Biochemical oxygen demand, Alaska,

Rivers, Aquatic microbiology, Dissolved gases, Oxygen, Ecology, Activated sludge process, Temperature, Lagoons (Ponds), Disinfection, Aeration, Salmon, Decay, Fresh water biology.
Identifiers: Eutrophication, Aeration ponds, Cold regions.

An international symposium on water pollution control in cold climates was sponsored by the Alaska Institute of Water Resources and the Federal Water Quality Administration in July 1970. Invited papers discussed waste treatment technology and effects of wastes upon Far Northern receiving waters.

PB-211 323
Environmental Protection Agency, Washington, D.C.
SEWAGE SLUDGE INCINERATION.

Aug 72, 95p* EPA-R2-72-040 W72-12631

Descriptors: (*Sludge disposal, *Incinerators), (*Sewage treatment, Sludge disposal), Fluidized bed processors, Furnaces, Air pollution control equipment, Waste disposal, Air pollution, Water pollution, Oceans, Performance evaluation, Abatement, Metals, Pesticides, Trace elements, Particles, Sulfur dioxide, Nitrogen oxides, Lead, Mercury, Chlorine organic compounds, Scrubbers, Ashes, Combustion products.
Identifiers: *Air pollution control, *Water pollution abatement, *Solid waste disposal, Ocean waste disposal, Biphenyl/chloro.

The report presents the findings of a Task Force which was established to evaluate sludge incineration as an acceptable alternative to ocean disposal. Multiple-hearth and fluidized bed furnaces, containing scrubbing devices for particulate removal, were selected for performance evaluation. The sludge, particulate, stack gas, scrubbing liquid, and ash were sampled and analyzed for heavy metals, pesticides, and oxides of nitrogen and sulfur. The results indicated that incinerators are capable of achieving low emission concentrations for the common pollutants. Particulate samples showed a measurable concentration of lead. The ash samples normally showed a higher concentration of the heavy metals when compared with the sludge samples. The pesticides and PCB results indicated complete destruction.

PB-211 332
Virginia Polytechnic Inst. and State Univ., Blacksburg. Center for Environmental Studies.
THE USE OF BLUEGILL BREATHING TO DETECT ZINC,
John Cairns, Jr., and Richard E. Sparks. Dec 71, 45p W72-12741 EPA-18050-EDQ-12/71
See also PB-211 333.
Paper copy available from GPO $0.55 as EP2.10:18050 EDQ 12/71.

Descriptors: (*Fishes, Indicator species), (*Water pollution, *Indicator species), (*Respiration, Fishes), (*Zinc, Indicator species), Toxicology, Monitors, Reproduction (Biology), Growth, Lethal dosage, Industrial wastes, Metals, Trace elements, Zinc sulfates.
Identifiers: *Water pollution effects (Animals), Fishkill, *Water pollution detection, Bluegills.

In conjunction with already existing methods for measuring the chemical and physical characteristics of water, methods for rapidly measuring biological effects of water quality would be very useful. Thus the authors studied the effects of pollution on the breathing rates of bluegills. The presence of zinc at concentrations of 8.7 5.22, 4.16 and 2.55 mg/l in dechlorinated municipal tapwater was detected by an increase in breathing rate or a change in breathing rate variance of bluegills. None of the fish exposed to the three lower concentrations died during the experiments. The criterion for detection was an arbitrary number of responses occurring at the same time. An in-plant system for the prevention of fish kills caused by spills could be developed by monitoring several biological functions of fish simultaneously.

PB-211 333
Virginia Polytechnic Inst. and State Univ., Blacksburg. Center for Environmental Studies.
THE USE OF FISH MOVEMENT PATTERNS TO MONITOR ZINC,
John Cairns, Jr., and William T. Waller. Dec 71, 58p W72-12742, EPA-18050-EDP-12/71
See also PB-211 332.
Paper copy available from GPO $0.65 as EP2.10:18050 EDP 12/71.

Descriptors: (*Fishes, Indicator species), (*Water pollution, *Indicator species), (*Zinc, Indicator species), Motion, Monitors, Toxicology, Metals, Trace elements, Industrial wastes, Reproduction, Growth, Lethal dosage, Carp, Shiners.
Identifiers: *Water pollution effects (Animals), Fishkill, *Water pollution detection, Bluegills.

A continuous monitoring system, consisting of an apparatus to detect light beam interruptions as a sign of aberrations in fish movement patterns, has been used to study the effects of fish exposure to lethal and sublethal concentrations of zinc. In addition to the exposure monitoring, the growth and reproductive success of exposed bluegill (Lepomis macrochirus) were studied. In the movement tests, Notemigonus crysoleucas and Carassius auratus were exposed to 2.94-3.64 mg/l zinc ions as zinc sulfate for 96 hrs. The ught system detected premortal movement aberrations allowing for survival of test fish by condition reversal. Analysis of LD50 levels was accomplished and recorded by atomic absorption spectrophotometry twice daily. Growth and reproduction tests involved exposure of one male and 3 females to Zn concentrations about equal to 0.1-0.01 of the lowest concentration detected by the monitoring tests. Eggs were collected and hatched separately. Concentrations of one-tenth the lowest zinc concentrations eliminated reproduction in the bluegills. (Author)

PB-211 334
Connecticut Univ., Storrs.
AUTOMATIC CONTROL OF AN ACTIVATED SLUDGE REACTOR.
Final rept., 16 Jun 60-30 Sep 70,
Herbert E. Klei. 11 Feb 71, 24p W72-12795, FWQA-17050-EVF-02/71

Descriptors: (*Activated sludge process, Automatic control), (*Sewage treatment, Activated sludge process), Pilot plants, Feedwater, Control equipment, Design, Sampling, Carbon, Carbon dioxide, Infrared spectroscopy, Concentration (Composition), Efficiency.

A feed forward control scheme was constructed and demonstrated on a pilot activated sludge reactor using as feed the primary effluent from a municipal treatment plant. The control scheme can be used to control both the air and recycle solids rates to the reactor to compensate for the increased carbon level in the feed stream. At normal detention times an improvement in process efficiency was observed with the control scheme.

PB-211 337
Woods Hole Oceanographic Institution, Mass.
CORRELATION OF OILS AND OIL PRODUCTS BY GAS CHROMATOGRAPHY.
Technical rept.,
O. Zafiriou, M. Blumer, and J. Myers. Jul 72, 117p WHOI-72-55

Descriptors: (*Gas chromatography, Oils), (*Water pollution, Oils), Sources, Reviews, Alkanes, Aromatic compounds, Sulfur organic compounds, Nitrogen heterocyclic compounds, Geochemistry, Biodeterioration, Weathering, Sampling, Crude oil, Fuel oil, Laboratory equipment, Handbooks, New York, Maine.
Identifiers: *Oil pollution, Asphaltenes, Oil spills.

Environmental samples of oil and oil products can be correlated with possible sources by comparison of their stable compositional features. Procedures for correlating samples with suspected sources by gas chromatographic analysis under standardized conditions are presented in manual form. A high rate of success for the method in realistic situations is estimated by analyses of artificially aged oils and of potential spill sources found in Greater New York Harbor and Portland, Maine. The method is suitable for routine use for weeks-old oil samples, and for monitoring levels of hydrocarbons in organisms and sediments. Slightly modified, it can be used in low-level and research work studying the fate and effects of petroleum hydrocarbons. (Author)

PB-211 338
Scientific Research Instruments Corp., Baltimore, Md.
KINETIC STUDIES ON THE PYROLYSIS, DESULFURIZATION, AND GASIFICATION OF COALS WITH EMPHASIS ON THE NON-ISOTHERMAL KINETIC METHOD.
Final rept. on Phase 2,
Marvin L. Vestal, Alan G. Day, III, J. S. Snyderman, Gordon J. Fergusson, and F. W. Lampe. Dec 69, 110p SRIC-70-14 APTD-1175
Contract PH-86-68-65
See also report dated Apr 69, PB-185 882.

Descriptors: (*Coal gasification, Reaction kinetics), (*Desulfurization, Coal gasification), (*Pyrolysis, Coal gasification), Bituminous coal, Hydrogen sulfide, Dolomite (Rock), Limestone, Iron sulfate, Pyrite, Calcium oxides, Steam, Chemical equilibrium.
Identifiers: Air pollution abatement, Low sulfur fuels, Sulfur containing fuels.

The research concerns sulfur control by means of coal gasification. Previous work has shown that desulfurization reactions on coal during pyrolysis and gasification are inefficient under equilibrium conditions. The experiments included measurements on the desulfurization kinetics (non-isothermal) for ten bituminous coals. An extensive series of measurements were conducted on the kinetics of H2S reactions with coal char and with the principal reactive constituents of char including carbon, iron, and calcium oxide. The kinetics of calcination for several dolomites and limestones were investigated. Experiments were also conducted on the pyrolysis of coal mixed with calcium oxide and on the gasification of coal with steam and oxygen both in the presence and absence of calcium oxide.

PB-211 374
Ludwig Engineering and Science Research Foundation, Arcadia, Calif.
FLOC STRENGTH AND FILTERABILITY OF PRETREATED WATER.
Final rept. 1967-1968.

Oct 68, 77p W72-12794, EPA-17030-10/68
Grants FWPCA-WP-00813-01, FWPCA-WP-00813-02

Descriptors: (*Clarification, *Flocculating), (*Sewage treatment, Clarification), (*Water treatment, Clarification), Flocculants, Quaternary ammonium salts, Polyelectrolytes, Pilot plants, Performance evaluation, Contacting, Filtration, Sewage filtration, Alums, Design criteria.

An experimental study of the interrelationships between filter operation, floc properties, and filter performance for water clarification was conducted. Two different clarification systems were investigated. One system had flocculation and sedimentation ahead of the filters. In the other, the pretreatment consisted of chemical addition and a brief period of rapid mixing. When operated in this latter manner, the filters were actually serving as contact flocculators. The technical and economic feasibility of water or waste water clarification by contact flocculation are demonstrated. It was concluded that a cationic polyelectrolyte, cat-floc

(dimethylpentamethylene ammonium chloride), is more effective than alum. A dual media filter, consisting of a very coarse, uniform coal layer on top of a shallow sand layer, performed better than others. The dependence of filter performance on such factors as chemical dose, filtration rate, and raw water suspended solids was also examined.

PB-211 376
Bendix Research Labs., Southfield, Mich.
CONTROL OF NO (X) EMISSIONS FROM MOBILE SOURCES.
Final rept.
Apr 72, 200p RLD-6213
Contract EPA-EHSH-70-122

Descriptors: (*Air pollution, Exhaust gases), (*Automobile engines, *Exhaust gases), (*Nitrogen oxides, Exhaust gases), Carburetors, Internal combustion engines, Fuel injectors, Carbon monoxide, Hydrocarbons, Intake systems, Engine valves, Dynamometers, Air intakes, Spark plugs.
Identifiers: *Air pollution control, *Automobile exhaust, Air fuel ratio.

A report is presented of a program for which the objective was to reduce NO (x) mass emissions from a 4000-pound GVW vehicle by extending the operation of the engine in the ultra-lean air/fuel regime. The Phase I effort of the program consisted of a baseline vehicle evaluation with a carburetor, installation of Electronic Fuel Injection (EFI), and the baseline evaluation with EFI. The Phase II effort consisted of removing the engine from the vehicle and installing it on an engine dynamometer, performing steady-state tests at selected power test points, and, finally, exploring the possible ultra-lean operation using various parameters. The potential of reducing the NO (x) emissions with ultra-lean mixtures is seen clearly. However, ultra-lean mixtures are very prone to misfire resulting in increased HC emissions and rough engine operation giving poor drivability. On the other hand, the oxygen-rich exhaust, resulting from lean operation, appears to offer the possibility of a thermal reactor or a catalyst for oxidizing HC without secondary air.

PB-211 399
Earth Satellite Corp., Washington, D.C.
LAND USE INDICATORS OF ENVIRONMENTAL QUALITY. AN EXAMINATION OF EXISTING FEDERAL DATA AND FUTURE NEEDS.
Final rept.

15 Apr 72, 152p
Contract EQC-213
Errata sheet inserted.

Descriptors: (*Land use, Data), (*United States Government, Land use), (*Environmental engineering, Information systems), Evaluation, Data acquisition, Standardization, Project Planning, Classifications, Data processing, Recommendations, Forecasting.
Identifiers: *Land use indicators.

An examination and evaluation of land use data collected by the Federal Government is presented. The study examined the upgrading of existing data collection programs to provide greater uniformity among data and additional information required to address environmental problems.

PB-211 431
Kellogg (M. W.) Co., Piscataway, N.J. Research and Engineering Development.
REVIEW OF THE DRY LIMESTONE INJECTION PROCESS.
Final rept. on Task 3 for Phase 1, Sep 70-May 71.
A. G. Sliger, J. A. Bellott, G. M. Drissel, C. J. Royce, and L. J. Scotti. 1 May 72, 279p*
MWKLG-RED-72-1271 APTD-1136
Contract CPA-70-68

Descriptors: (*Limestone, *Adsorbents), (*Air pollution, Sulfur dioxide), (*Sulfur dioxide, *Chemisorption), Calcium oxides, Calcium sulfates, Diffusion, Dolomite (Rock), Coal, Combustion, Boilers, Particles, Furnaces, Injection, Pilot plants, Sulfation, Reaction kinetics, Mathematical models, Roasting, Particle size, Porosity, Thermochemistry, Corrosion, Degradation, Thermal power plants, Water pollution, Ashes.

One means of reducing SO2 air pollution from fuel combustion involves the injection of limestone directly into a furnace to effect vapor phase calcination and sulfation reactions. The report reviews this process and its basic objective to provide an independent assessment of the status of the Dry Limestone Process Technology and to update the design bases to reflect any additional process information. All available information was reviewed on the Fry Limestone Injection Process and pertinent correlations and equipment design recommendations were derived wherever possible. The emphasis was placed on the evaluation of data from in situ calcination-sulfation studies taken in flow reactors designed to simulate commercial boilers. The correlation approach was developed for a 'shrinking core' model, i.e., where SO2 gas must diffuse through a reaction product layer (CaSO4) to reach the shrinking inner core of available reactant (CaO). Attempts were made to test the reaction system model against data obtained in other flow reactor studies. Efforts were also made to compare the model with some initial test data. Available information was reviewed for the obvious important equipment performance parameters, e.g., effect of additives on slagging characteristics, efficiency of dust removal equipment, and sluice water quality control.

PB-211 435
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
AIR POLLUTION ASPECTS OF EMISSION SOURCES: IRON AND STEEL MILLS. A BIBLIOGRAPHY WITH ABSTRACTS.
May 72, 86p AP-107
Paper copy available from GPO $1.00 as EP4.9:107.

Descriptors: (*Iron and steel industry, Air pollution), (*Air pollution, Industrial wastes), (*Bibliographies, Air pollution), Sources, Foundries, Metals, Dust control, Detectors, Occupational diseases, Public health, Atmospheric corrosion, Plants (Botany), Standards, Steel plants.
Identifiers: Air pollution control, Air pollution detection, Air pollution effects (Animals), Air pollution effects (Plants), Air pollution effects (Materials).

Iron and steel mills contribute significantly to the overall air pollution level in the United States. The bibliography was compiled to aid efforts to improve air quality in this regard. Approximately 302 abstracts have been selectively screened to cover the following 14 categories: Emission sources; Control methods; Measurement methods; Air quality measurements; Atmospheric interaction; Basic science and technology; Effects - human health; Effects - plants and livestock; Effects - materials; Effects - economic; Standards and criteria; Legal and administrative; Social aspects; and General. (Author)

PB-211 438
Esso Research Centre, Abingdon (England).
STUDY OF CHEMICALLY ACTIVE FLUID BED GASIFIER FOR REDUCTION OF SULFUR OXIDE EMISSIONS.
Final rept. 22 Jun 70-Mar 72,
J. W. T. Craig, G. L. Johnes, G. Moss, J. H. Taylor, and D. E. Tisdall. Jun 72, 347p* EPA-R2-72-020
CPA-70-46

Descriptors: (*Fuel oil, *Desulfurization), (*Limestone, *Adsorbents), (*Air pollution, *Sulfur dioxide), (*Sulfur inorganic compounds, *Adsorption), (*Fluidized bed processors, *Air pollution control equipment), (*Furnaces, Air pollution control equipment), Calcium oxides, Gasification, Materials recovery, Great Britain, Combustion products, Design, Vanadium, Scale (Corrosion), Regeneration (Engineering), Pilot plants, Performance evaluation.
Identifiers: *Chemically Active Fluid Bed Process, *Air pollution control, Waste gas recovery.

The Chemically Active Fluid Bed (CAFB) process involves the desulfurization of a fuel oil using a hot fluidized bed of lime to oxidize and gasify the oil. The lime is then regenerated and reused. The present report discusses the following: Survey operating characteristics of two limestones and one residual fuel oil to determine their suitability; Select the best of the two stones for further testing; Construct two new batch reactor CAFB laboratory experimental units; Measure the effects of important operating variables on the CAFB process using batch reactor experiments with the selected oil-limestone combination; Operate for 200 hours of gasification a continuous CAFB gasification pilot plant.

PB-211 448
Hamilton Waste Water Treatment Plant, Ohio.
FULL SCALE CONVERSION OF ANAEROBIC DIGESTERS TO HEATED AEROBIC DIGESTERS.

Aug 72, 62p EPA-R2-72-050
Contract WPRD-187-01-68

Descriptors: (*Digesters, *Aerobic processes), (*Sewage treatment, Aerobic processes), Heating, Paper industry, Industrial wastes, Odors, Conversion, Heat measurement, Digestion (Decomposition), Sludge digestion, Design criteria, Ohio.
Identifiers: Hamilton (Ohio).

Full plant scale experiments were made to determine the effect of heated aerobic digesters on digestion of waste water treatment plant sludge. Existing heated, floating cover equipped, anaerobic digesters, which had failed under excessive paper mill waste discharge, were converted to this purpose by addition of blower supplied air. Excessive odor production as temperatures increased prevented conclusion of the total program or any single phase. No practical method for control of temperature resultant from bacterial energy exerted in volatile reduction could be devised. The experiment was beneficial in determining the extent of practical application, and in establishing that thermophilic digestion temperature ranges could have produced significant volatile reduction. Determinations made also afford a measure of energy (heat) generated by aerobic bacteria in destruction of waste.

PB-211 451
Engineering-Science, Inc., Cincinnati, Ohio.
INVESTIGATION OF RESPONSE SURFACES OF THE MICROSCREEN PROCESS.

Dec 71, 140p W72-12960, EPA-17090-EEM-12/71
Contract FWPCA-14-12-819
Paper copy also available from GPO $1.25 as EP2.10:17090 EEM 12/71.

Descriptors: (*Sewage filtration, *Size screening), (*Sewage treatment, Size screening), (*Clarification, Sewage treatment), Reviews, Pilot plants, Performance evaluation, Field tests, Activated sludge process, Trickling filtration, Lagoons (Ponds), Particle size, Design criteria, Mathematical models, Computer programs.
Identifiers: *Microscreens, Tertiary sewage treatment.

Field, laboratory, theoretical, and state-of-the-art studies were conducted with regard to use of microscreens for tertiary sewage treatment appli-

cations. Field studies were conducted with two pilot microscreen units, using a variety of screen sizes and types, for activated sludge, trickling filter, and oxidation pond effluents. Particle size distribution of the effluents (microscreen influents) were found to be the key characterizing parameter in determination of treatment effectiveness. Overall effectiveness of solids removal was low, and was ascribed to deficiencies in microscreen design practice for the transfer of screened solids from the screen to the backwash system and out of the microscreen unit. A computer model of the process was developed in a format compatible with the EPA Executive Program for Optimization of Treatment Systems. (Author)

PB-211 460
Lake Tahoe Area Council, South Lake Tahoe, Calif.
EUTROPHICATION OF SURFACE WATERS--LAKE TAHOE.
Water pollution control research series.

May 71, 157p W72-12955, EPA-16010-DSW-05/71
See also PB-211 462
Paper copy available from GPO $1.25 as EP2.10:16010 DSW 05/71.

Descriptors: (*Limnology, *Nutrients), (*Water pollution, Limnology), California, Lakes, Fresh water biology, Algae, Water analysis, Sources, Nitrogen, Phosphorus, Leaching, Earthfills, Waste disposal, Sewage, Septic tanks, Hydrology, Subsurface drainage, Surface water runoff, Bioassay.
Identifiers: *Lake Tahoe, *Eutrophication, Sewage treatment effluent, Sanitary landfills.

A survey was made of nutrient and other chemical constituents of surface waters from developed and undeveloped land areas, sewage effluents, seepage from septic tank percolation system and refuse fills, drainage from swamps, precipitation, and Lake Tahoe water. Algal growth stimulating potential of the samples were bioassayed with Selenastrum gracile as a test organism. Algal response to nutrients was measured by maximum growth rate and maximum cell count in a 5-day growth period. Ponds simulating the shallow portions of the lake were used for continuous flow assay of the biomass of indigenous lake organisms produced by sewage effluent. Flask assays and chemical analyses were made over two years on three major creeks. Twenty-eight other creeks and precipitations were monitored by chemical analysis. Evaluating the eutrophication potential, Lake Tahoe is nitrogen sensitive and responds to it in proportion to its concentration.

PB-211 461
Wisconsin Univ., Madison. Dept. of Bacteriology.
ROLE OF BACTERIA IN THE NITROGEN CYCLE IN LAKES.
Water Pollution Control research series,
Elizabeth F. McCoy. Mar 72, 28p W72-12956, EPA-16010-EHR-03/72
Paper copy available from GPO $0.35 as EP2.10:16010EHR03/72.

Descriptors: (*Limnology, *Nitrogen cycle), (*Nutrients, Limnology), (*Aquatic microbiology, Nitrogen cycle), Nitrogen fixing bacteria, Nitrification, Ammonia, Inorganic nitrates, Inorganic nitrites, Oxidation, Reduction (Chemistry), Fungi, Fishes, Toxicology, Actinomycetaceae.
Identifiers: Denitrification, Eutrophication.

Biological nitrification as contributing nitrite and nitrate to lakes and streams was explored by determining: nitrifiers, growth sites and activity; denitrifying bacteria numbers and their potential activity as opposing nitrification; field data on nitrite-nitrogen and nitrate-nitrogen in terms of nitrifier and denitrifier populations. Biological nitrification, both heterotrophic and autotrophic, was demonstrated. Even though opposing processes, nitrification and denitrification can coexist in close succession or in adjoining microhabitats. Field values for nitrate-nitrogen and nitrite-nitrogen vary considerably and must be viewed as net values at any given time. Thirteen species of fishes varied greatly in resistance to nitrite-nitrogen. Nitrite toxicity may influence fish species dominance in a eutrophic lake.

PB-211 462
Lake Tahoe Area Council, South Lake Tahoe, Calif.
EUTROPHICATION OF SURFACE WATERS--LAKE TAHOE INDIAN CREEK RESERVOIR.
Water pollution control research series.

Jul 71, 117p W72-12957, EPA-16010-DNY-07/71
See also PB-211 460.
Paper copy available from GPO $1.25 as EP2.10:16010 DNY 07/71.

Descriptors: (*Limnology, *Reservoirs), Nutrients, Water quality, Water reclamation, Biological productivity, Phosphorus, Nitrogen, Bioassay, Nitrification, California, Fresh water biology, Fishes, Algae.
Identifiers: *Eutrophication, *Sewage treatment effluent, Tertiary sewage treatment, Denitrification, Indian Creek Reservoir, Lake Tahoe.

The water impounded at Indian Creek Reservoir near Lake Tahoe, California is approximately one-third surface runoff and direct precipitation and two-thirds reclaimed water exported from South Tahoe Public Utility District Plant. Discussed are the results of tests which determined the temporal changes and relationships between water quality characteristics of Indian Creek Reservoir and those of the reclaimed water. Initially the reservoir would not support fish life, but as the reservoir matured, ammonia levels declined to less than 4 mg/l and by 1970 it was an excellent trout fishery. Approximately 70% of the ammonia nitrogen was lost to the atmosphere by nitrification-denitrification. Good biological productivity indicated access to other phosphorus sources, probably runoff. Relative to conductivity and chemical components the water is of good irrigation quality. Various parameters showed that the reservoir responds to more complex factors than those measurable in the reclaimed waste water, raising the question of the effectiveness of tertiary treatment for recreational impoundments.

PB-211 463
Autotrol Corp., Milwaukee, Wis. Bio-Systems Div.
APPLICATION OF ROTATING DISC PROCESS TO MUNICIPAL WASTEWATER TREATMENT.
Water pollution control research series.

Nov 71, 75p W72-12959, EPA-17050-DAM-11/71
Contract FWPCA-14-12-810
Paper copy available from GPO $0.75 as EP2.10:17050 DAM 11/71.

Descriptors: (*Sewage treatment, *Aerobic processes), Films, Drums (Chemical engineering), Package sewage plants, Performance evaluation, Chemical removal (Sewage treatment), Ammonia, Nitrogen, Phosphorus, Suspended sediments, Clarification, Biochemical oxygen demand, Wisconsin.
Identifiers: *Rotating disc process, Pewaukee (Wisconsin).

A prototype package plant incorporating the rotating disc wastewater treatment process was tested on municipal wastewater at the Village of Pewaukee, Wisconsin, to evaluate its treatment capabilities and establish guidelines for operation and testing of a full-scale rotating disc demonstration plant soon to be put into operation at Pewaukee. The package plant included a rotating bucket feed mechanism, ninety-one 1.75 meter diameter discs divided into two stages, and a secondary clarifier with a sludge-removal mechanism. Variables tested included hydraulic loading, rotational disc speed, sludge recycle, and wastewater treatment as it varied with climatic conditions.

PB-211 464
Goodrich (B. F.) Chemical Co., Cleveland, Ohio. Environmental Control Dept.
WASTEWATER TREATMENT FACILITIES FOR A POLYVINYL CHLORIDE PRODUCTION PLANT.

Jun 71, 76p W72-12958, EPA12020-DJT-06/71
Paper copy available from GPO $1.00 as EP2.10:12020 DJT 06/71.

Descriptors: (*Water pollution, *Industrial wastes), (*Industrial waste treatment, *Polyvinyl chloride), Latex, Chemical industry, Coagulation, Flocculating, Clarification, Iron inorganic compounds, Coagulants, Activated sludge process, Pilot plants, Biochemical oxygen demand, Aerobic processes, Process variables, Suspended sediments, Dissolved organic matter.
Identifiers: Biological industrial waste treatment.

The report discusses the investigations of various types of wastewater treatment systems to adequately treat wastes from a polyvinyl chloride plant. Both primary and secondary treatment methods were investigated. Waste equalization; solids removal by chemical coagulation, dissolved air flotation, and clarification; activated carbon adsorption; contact stabilization; completely mixed activated sludge; and various other methods were considered and studied. The report discusses the studies performed with a major emphasis placed on those processes found most applicable to the treatment of PVC wastes. A description of laboratory methods and pilot plant equipment is included. Typical data is presented and interpreted in terms of process design. In addition, full-scale plant operation is discussed in relation to individual unit operations and unit processes. Actual operating data is included. Lastly, wastewater recycle and reuse is included.

PB-211 466
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XVI. SOME BASIC PROPERTIES OF ASH AND INDUSTRIAL DUST IN RELATION TO THE PROBLEM OF PURIFICATION OF STACK GASES.

1972, 84p AICE-AIR-72-16 APTD-1299
Grant EPA-R-80[illegible]
See also Volume 15, PB-211 074.

Descriptors: (*Air pollution, Particles), (*USSR, Air pollution), (*Air pollution control equipment, Particles), (*Dust control, Air pollution control equipment), Industrial wastes, Flue gases, Dust collectors, Chimneys, Electrical resistance, Moisture content, Detectors, Samplers, Particle size, Cyclone separators, Atmospheric motion, Sulfur dioxide, Design criteria.
Identifiers: *Air pollution control.

Three chapters are translated from Ochistka Dymovykh Gazov v Promyshlennov Energetike. (Purification of Stack Gases in the Power Industry.) They are: The general aspects of the design and operation of gas purification systems; Principles of design of gas purification systems; and Determination of the basic properties of dusts and gases.

PB-211 479
Office of Radiation Programs, Washington, D.C. Surveillance and Inspection Div.
RADIOACTIVE WASTER DISCHARGES TO THE ENVIRONMENT FROM NUCLEAR POWER FACILITIES. ADDENDUM-1.
Surveillance rept. 1959-70,
Joe E. Logsdon, and Thomas L. Robinson. Oct 71, 33p ORP/SID-71-1 BRH/DER-70-2-Add
See also PB-190 717.

Descriptors: (*Nuclear power plants, *Radioactive contaminants), (*Water pollution, Radioactive contaminants), (*Air pollution, Radioactive contaminants), Sources, Assessments, Radioactive wastes, Halogens, Radioactive isotopes, Concentration (Composition), Boiling water reactors, Radioactive waste processing, Pressurized water reactors, High temperature gas cooled reactors, Tritium, Standards.

The report summarizes discharges of liquid and gaseous radioactive wastes from 13 nuclear power facilities. It includes a discussion of sources, types, and trends of discharges, administrative controls, and operating experiences of the facilities. The report includes an appendix for each facility, describing characteristics of the plant and its discharge limits, and a brief operational history. (Author)

PB-211 480
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
LABORATORY STUDIES AND MATHEMATICAL MODELING OF NOX FORMATION IN COMBUSTION PROCESSES.
Final rept.,
William Bartock, Victor S. Engelmen, and Eduardo G. del Valle. 31 Dec 71, 246p
GRU.3GNOS.71 APTD-1168
Contract CPA-70-90

Descriptors: (*Combustion, Reaction kinetics), (*Combustion products, *Nitrogen oxides), (*Air pollution, Nitrogen oxides), Combustion, Burners, Combustion chambers, Gas analysis, Gas chromatography, Mixing, Mathematical models, Computer programs, Carbon monoxide, Heat transfer, Hydrogen, Hydrocarbons, Additives.

Laboratory studies were conducted to investigate the basic factors affecting nitrogen oxide formation in the combustion of fossil fuels. A jet-stirred combustor and a multiburner (so-named because of its ability to burn gas, oil or pulverized coal fuels) were used. The jet stirred combustor was used to study NO (x) formation in combustion under kinetically limited conditions. The combustion conditions were selected to be pertinent to stationary sources such as furnaces and boilers with peak temperatures ranging from 2500-3500 F. Preliminary experiments were performed with the multiburner which indicated the influence of heat losses and residence time on NO (x) emissions in the combustion of methane/air. The multiburner was used as a rudimentary flow reactor to study the formation of nitrogen oxides in air at high temperatures. The mathematical model has been extended to allow calculations of NO formation under fuel-rich conditions. Particle combustion capability has been incorporated into the model and mixing effects can be handled with the macromixing option. Test cases have been run for the above options which indicate the correct order of magnitude predictions and the correct directional effect of combustion modifications on NO (x) emissions.

PB-211 481
Scientific Research Instruments Corp., Baltimore, Md.
SULFUR BEHAVIOR AND SEQUESTERING OF SULFUR COMPOUNDS DURING COAL CARBONIZATION, GASIFICATION, AND COMBUSTION.
Final rept.,
Marvin L. Vestal, Alan G. Day, III, J. S. Snyderman, Gordon J. Fergusson, and F. W. Lampe. May 71, 136p SRIC-71-15 EPA-R2-72-041
Contract CPA-70-50

Descriptors: (*Coal preparation, *Desulfurization), (*Hydrogenation, Coal preparation), Reaction kinetics, Chemical reactors, Hydrogen sulfide, Inorganic sulfides, Computer programs, Reduction (Chemistry), Pyrite, Bituminous coal, Lignite, Anthracite, Dolomite (Rock), Air pollution, Abatement, Sulfur dioxide, Calcium oxides, Pyrolysis.
Identifiers: *Air pollution abatement.

A description is presented of studies on coal desulfurization and related investigations. The work has emphasized the application of non-isothermal kinetic studies to the theoretical, experimental, and practical problems associated with the removal of sulfur from coal. To increase the efficiency and precision of data acquisition and interpretation, a computerized non-isothermal kinetic laboratory has been designed, built, and put into operation. Detailed non-isothermal kinetic studies of the desulfurization and gasification of five bituminous coals, lignite, anthracite, and pyrite, under reducing and oxidizing atmospheres have been conducted. An attempt has been made to identify the types of sulfur bonding associated with the removal of sulfur. Non-isothermal kinetic measurements7 of the removal of hydrogen sulfide produced in the desulfurization under both reducing and oxidizing condition by calcium oxide and dolomite have been carried out. Reactions of hydrogen sulfide with iron, iron sulfide, and various coal chars have also been investigated.

PB-211 494
Westinghouse Research Labs., Pittsburgh, Pa.
EVALUATION OF THE FLUIDIZED BED COMBUSTION PROCESS. VOLUME I. SUMMARY REPORT.
Report for 15 Nov 69-15 Nov 71,
D. H. Archer, D. L. Keairns, J. R. Hamm, R. A. Newby, and W. C. Yang. 15 Nov 71, 203p* APTD-1165
Contract CPA-70-9

Descriptors: (*Fluidized bed processors, *Desulfurization), (*Air pollution control equipment, Fluidized bed processors), (*Combustion products, Fluidized bed processors), (*Coal, Fluidized bed processors), (*Limestone, *Adsorbents), (*Sulfur dioxide, *Air pollution), (*Fuel oil, Desulfurization), Furnaces, Boilers, Electric power plants, Combustion, Nitrogen oxides, Gasification, Design, Performance evaluation, Cost estimates, Operating costs, Capital costs, Industrial engineering, Sulfur, Regeneration (Engineering), Injection, Steam electric power generation.
Identifiers: *Air pollution control, *Limestone injection, Waste gas recovery.

Fluidized bed processing of high-sulfur fossil fuels is evaluated for economical steam and/or power generation within projected pollution control limits. In fluidized bed combustion the sulfur dioxide and nitrogen oxides are minimized during the combustion process, and the heat transfer from the burning fuel to evaporating water is facilitated to achieve a more economical boiler system. In fluidized bed gasification a clean fuel gas with minimal sulfur and particulates is produced which can be utilized for power generation at atmospheric pressure in conventional gas-fired boilers or at elevated pressures in a gas-turbine combustor. The report is a condensation of the complete report; all the technical details of the work are contained in Volume II and III which will be released at a later date. No problems have been identified which would preclude the development of fluidized bed combustion boilers. The atmospheric pressure fluidized bed oil gasification concept has been technically demonstrated with a 750 kW development gasification plant.

PB-211 504
IIT Research Inst., Chicago, Ill.
ELECTRON PARAMAGNETIC RESONANCE (EPR) INVESTIGATION OF LIMESTONES AND THEIR CALCINES AND CORRELATION WITH REACTIVITY WITH ACID GASES.
Final rept. 23 Jun 70-22 Jan 72,
Nicholas A. Ashford, and Frank H. Jarke. 18 Feb 72, 78p IITRI-C6241-7 EPA-R2-72-019
Contract EPA-68-02-0208

Descriptors: (*Limestone, *Electron paramagnetic resonance), (*Calcium oxides, Electron paramagnetic resonance), (*Carbonate rocks, Electron paramagnetic resonance), Crystal structure, Chemical reactions, Sulfur dioxide, Roasting, Slaking, Air pollution, Hydration, Control, Manganese, Correlation, Geochemistry, Iron, Trace elements.
Identifiers: Limestone scrubbing, Air pollution control.

A research program was undertaken to investigate a selected set of calcined and uncalcined carbonate rock samples by electron paramagnetic resonance (EPR) spectroscopy in order to assist in the characterization of marls and chalks to identify properties which account for their high reactivity with SO2, establish a semi-quantitative basis for evaluating a crystalline order of limestones to predict their reactivity with acid gases, investigate the effect of altering the calcination temperature on the crystalline structure of calcines in order to identify those properties which account for the varying reactivity and deadburning, and investigate the effects of slaking on the crystalline parameters of calcines produced at different temperatures in order to support wet limestone scrubbing process development using manganese ions as a probe of calcium carbonate crystallinity, the fitting of manganese EPR line width data to the SO2 reactivity and capacity data resulted in correlation coefficients of r = 0.55 and 4 = 0.49 respectively. No significant EPR linewidth correlation was found for the reactivity and capacity of calcined materials. (Author)

PB-211 505
Mitre Corp., McLean, Va.
SURVEY OF COAL AVAILABILITIES BY SULFUR CONTENT.
Final rept.,
L. Hoffman, F. J. Lysy, J. P. Morris, and K. E. Yeager. May 72, 171p* MTR-6086 EPA-R2-72-022

Descriptors: (*Coal, Availability), (*Reserves, Coal), Sulfur, Concentration (Composition), Strip mining, Marketing, Transportation, Natural resources, Benefit cost analysis, Cost estimates, Desulfurization, Coal preparation, Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, Wyoming.
Identifiers: *Sulfur containing fuels, Coal (Low sulfur), Coal (High sulfur), *Air pollution abatement, Rocky Mountain States.

The report quantifies present and future availabilities of commercial steam coal by rank and sulfur content. In this regard, coal reserves, steam coal production, and mining growth potentials are quantified. In addition the changes in eastern coal availability by sulfur content that would result from physical desulfurization are also quantified. The potentials of physical cleaning and the potentials of Rocky Mountain Strippable reserves to provide low-sulfur coal for central and eastern markets are also examined. (Author)

PB-211 554
HBR-Singer, Inc., State College, Pa. Environmental Sciences Branch.
DETECTION OF ABANDONED UNDERGROUND COAL MINES BY GEOPHYSICAL METHODS.

Apr 71, 105p W72-13045, EPA-14010-EHN-04/71
Paper copy available from GPO $1.00 as EP2.10:14010 EHN 04/71.

Descriptors: (*Geophysical prospecting, Coal mines), (*Mine waters, *Water pollution), (*Coal mines, Abandonment), Mine surveys, Geophysical surveys, Seismic reflection method, Seismic refraction method, Resistivity exploration, Impedance exploration, Feasibility.
Identifiers: *Abandoned coal mines.

Acid drainage produced by abandoned coal mines continues to cause serious water pollution problems. Without knowing the exact location of

the concealed openings and the extent of the mine, source abatement techniques are virtually impossible. Drilling is the only known method for accurately determining the location and extent of the mine voids, but this is extremely expensive. This project attacks the problem through field studies of the following geophysical methods: electrical resistivity, self-potential, infrared radiometry, total field and differential magnetometry, seismic refraction and reflection, very low frequency electromagnetic and induced polarization over well-documented, drift, coal mines. Airborne infrared radiometry proved to be an excellent tool for detecting and mapping acid mine/fresh water sources, acid mine/fresh water drainage, and fracture traces under selected conditions. (Author)

PB-211 563
Soap and Detergent Association, New York.
SOLUBLE PHOSPHORUS IN THE ACTIVATED SLUDGE PROCESS. PART I. CHEMICAL--BIOLOGICAL PROCESS PERFORMANCE.
Water pollution control research series.

May 71, 122p W72-13039, EPA-17010-EIP-05/71
See also Part 2, PB-211 564.
Paper copy available from GPO $1.25 as EP2.10:17010EIP05/71.

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Sewage treatment, Phosphorus), (*Activated sludge process, Chemical removal (Sewage treatment)), (*Alums, Chemical removal (Sewage treatment)), Precipitation (Chemistry), Aluminum sulfate, Aeration, Dissolved organic matter, Suspended sediments, Performance (Evaluation), Cost estimates, Nutrients, pH.

The objective was to develop and evaluate, at full plant scale, the combined chemical-biological process of phosphorus removal. Alum proved to be a more effective precipitant than sodium aluminate in the moderately alkaline wastewater used. Total phosphorus concentration of the unfiltered effluent was dependent upon effluent suspended solids levels as well as on effluent soluble phosphorus concentrations. Removal of organic matter was improved as a result of chemical addition in the chemical-biological process. The chemical-biological process produced approximately twice as much weight of sludge as did the parallel control. Alum addition did not reduce the sludge volume index (SVI) of the mixed liquor whereas sodium aluminate addition resulted in significant decreases. Costs for chemical precipitation of phosphorus in the chemical-biological process are estimated. (Author)

PB-211 564
Soap and Detergent Association, New York.
SOLUBLE PHOSPHORUS REMOVAL IN THE ACTIVATED SLUDGE PROCESS. PART II. SLUDGE DIGESTION STUDY.
Water pollution control research series.
Oct 71, 64p W72-13040, EPA-17010-EIP-10/71
See also Part 1, PB-211 563.
Paper copy available from GPO $0.65 as EP2.10:17010 EIP 10/71.

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Sewage treatment, Phosphorus), (*Activated sludge process, Chemical removal (Sewage treatment)), Alums, Aluminum sulfate, Precipitation (Chemistry), Performance evaluation, Sludge digestion, Nutrients, Design criteria, pH, Gases, Methane, Inorganic sulfates, Inorganic phosphates.

Sludges containing aluminum phosphorus precipitates from an activated sludge waste water treatment plant were digested in a high-rate digester. Sodium aluminate and liquid alum were used to precipitate the phosphorus from the waste water. Analyses on both raw and digested sludges showed that once precipitated from the waste water and incorporated into a sludge the phosphorus did not redissolve while undergoing anaerobic digestion. Most of the soluble phosphorus in both the raw and digested sludges was in the orthophosphate form, and the addition of the inorganic aluminum phosphorus complexes did not adversely affect the anaerobic digester. High concentrations of soluble aluminum ion did not appear in the anaerobic digester, and the use of alum for phosphorus removal caused no additional hydrogen sulfide production during sludge digestion. Analyses also indicated the addition of aluminum compounds enhanced the dewatering properties of the raw sludges. (Author)

PB-211 566
Boyce Thompson Inst. for Plant Research, Inc., Yonkers, N.Y.
INTERACTION OF HERBICIDES AND SOIL MICROORGANISMS.
Water pollution control research series.
Mar 71, 75p W72-13044, EPA-16060-DMP-03/71
Paper copy available from GPO $0.75 as EP2.10:16060 DMP 03/71.

Descriptors: (*Soil microbiology, *Herbicides), (*Biodeterioration, *Pesticides), (*Chlorine organic compounds, Biodeterioration), Additives, Soil chemistry, Bacteria, Hyrolysis, Phthalates, Chlorine aromatic compounds, Carbamates, Uracils, Cultures (Biology), Ureas, N-heterocyclic compounds, Fungi, Penicillium.
Identifiers: *Water pollution abatement, *Propham, *DCPA herbicide, *Bromacil, Monuron, Atrazine, Dicamba, Amiben, Diuron.

The introduction of microorganisms with specific degradative capacities into the soil was shown to be a possible means of ridding the soil of contaminating chemicals. An investigation of the interactions of soil microorganisms and several groups of herbicidal compounds, primarily chlorinated derivatives, was made. In pure ulture and in soils the addition of 2,3,5,6-tetrachloroterephthalate (DCPA) had little effect upon bacterial growth, and several microorganisms appeared to use the herbicide as a carbon source. The encouragement of the soil microflora by the addition of nutrient broths resulted in a reduction of toxicity to plants of a number of herbicides. Isopropyl N-phenylcarbamate (IPC) degrading organisms, when added to soil, accelerated the degradation of IPC and related compounds. A membrane 'biologicalilter' device for reducing waterborne biodegradable pollutants was also demonstrated using these organisms.

PB-211 604
AiResearch Mfg. Co., Los Angeles, Calif.
OIL/WATER SEPARATION SYSTEM WITH SEA SKIMMER.
Water pollution control research series.

Oct 70, 191p W72-13253, EPA-15080-DJP-10/70
Contract FWPCA-14-12-524
Paper copy available from GPO $1.50 as EP2.10: 15080 DJP 10/70.

Descriptors: (*Water pollution, Oils), (*Oils, *Skimmers), Oceans, Centrifuging, Design, Performance evaluation, Field tests, Crude oil, Cost estimates, Capital costs, Operating costs, Benefit cost analysis, Paddles.
Identifiers: *Oil water separators, *Oil pollution removal, Oil pollution, Oil spills.

The design, construction, and testing of, an oil skimming and separation system capable of processing 30,000 gallons per hour, and operating on the open ocean under Sea State 3 conditions is described. A 45 x 26-foot twin-hulled barge, which contained an entrance paddle wheel and self-adjusting skimming weirs, was built to support the skimming and separation equipment. A 500-gpm centrifuge was used to reduce the oil content of the discharge water to less than 100 ppm. The recovered oil contained less than 5 percent water. The oil content of the discharge water could be reduced to less than 20 ppm by recycling it through the centrifuge a second time. Intentionally spilled oils of API 15, 26, and 35 gravities were recovered and separated, as were weathered oil slicks. The centrifuge was particularly useful in separating the mixtures of water and the higher API gravity oils.

PB-211 605
California Univ., Berkeley. Sanitary Engineering Research Lab.
OPTIMIZATION OF AMMONIA REMOVAL BY ION EXCHANGE USING CLINOPTILOLITE.
Water pollution control research series.

Sep 71, 192p W72-13254, EPA-17080-DAR-09/71
Paper copy available from GPO $1.50 as EP2.10:17080 DAR 09/71.

Descriptors: (*Chemical removal (Sewage treatment), *Ammonia), (*Ion exchanging, Ammonia), (*Sewage treatment, Ion exchanging), PH, Nitrogen, Cost estimates, Performance evaluation, Pilot plants, Regeneration (Engineering), Operating costs, Design, Capital costs.
Identifiers: Zeolites, Tertiary sewage treatment.

The zeolite ion exchanger clinoptilolite was investigated with the objective of optimizing its application to ammonia removal from wastewaters. The study included multiple cycle pilot plant operations at three municipal sewage treatment plants. Particular attention was given to cation interference with exhaustion performance and with minimum cost regeneration. The ammonia capacity of clinoptilolite was found to be nearly constant over the pH range of 4 to 8. In regeneration the pH was critical in determining the NaCl requirements, a higher pH favoring lesser amounts of salt. An average ammonia removal of 95.7% was obtained. The cost of ammonia removal was estimated. Ammonia removals down to less than 0.5 mg/l NH3-N is technically feasible, but only with shorter exhaustion runs and greater regenerant requirements. (Author)

PB-211 621
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
A PREDICTIVE MODEL FOR THERMAL STRATIFICATION AND WATER QUALITY IN RESERVOIRS.
Mark Markofsky, and Donald R. F. Harleman. Jan 71, 286p W72-13309, EPA-16130-DJH-01/71
Paper copy available from GPO $2.00 as EP2.10:16130 DJH 01/71.

Descriptors: (*Reservoirs, Water quality), (*Water quality, Mathematical models), (*Temperature gradients, Reservoirs), Stratification, Water pollution, Stream pollution, Mixing, Lakes, Water flow, Diffusion, Computer programs, Heat, Dissolved gases, Oxygen, Biochemical oxygen demand, Forecasting.

Modifications are made on a one-dimensional analytical thermal stratification prediction method to include the time required for inflowing water to reach a dam face. A one-dimensional water quality model is developed which incorporates the internal flow pattern predicted for a stratified reservoir from the temperature model. The water quality model is designed to predict the concentration of particular water quality parameters in the outflow water as a function of time. It is tested by comparisons with measurements of outlet concentrations resulting from pulse injections of a conservative tracer into a laboratory reservoir. The application of the mathematical model to a field case of practical interest is demonstrated by solving the coupled set of water quality equations for B.O.D. and D.O. predictions in Fontana Reservoir. It is concluded that the model is capable of predicting the effect of reservoir impoundments on water quality.

PB-211 747
Environmental Protection Agency, Research Triangle Park, N.C. Div. of Atmospheric Surveillance.
SAROAD STATION CODING MANUAL,
Donald H. Fair. Feb 72, 140p APTD-0907
See also report dated Jul 71, PB-207 348.

Descriptors: (*Air pollution, *Coding), (*Data retrieval, Air pollution), Tables (Data), United States, Sites, Stations.
Identifiers: Air pollution sampling, *SAROAD (Storage and Retrieval of Aerometric Data), Air quality data.

A revised edition of the initial 1966 SAROAD Station Coding Manual is presented. The SAROAD (Storage and Retrieval of Aerometric Data) Station Coding Manual identifies areas of the United States and their associated codes used in operation of the National Aerometric Data Bank. Station identification is one phase of the overall SAROAD system. (Author)

PB-211 748
Radian Corp., Austin, Tex.
A STUDY OF THE LIMESTONE INJECTION WET SCRUBBING PROCESS. VOLUME I.
Final rept.,
Philip S. Lowell, and Delbert M. Ottmers. 1 Nov 71, 140p* APTD-1183
Contract CPA-70-45
See also Volume 2, PB-211 749.

Descriptors: (*Limestone, *Adsorbents), (*Adsorption, *Sulfur dioxide), (*Air pollution, Sulfur dioxide), (*Scrubbers, Sulfur dioxide), Mathematical models, Process control, Performance evaluation, Computerized simulation, Pilot plants, Enthalpy, Chemical equilibrium, Computer programming, Sulfites, Thermodynamics, Chemical engineering, Electric power plants, Nitrogen oxides.
Identifiers: *Limestone scrubbing, Alkaline scrubbing, *Air pollution control.

Previously a theoretical interpretation of the complex chemistry and chemical engineering aspects of the limestone injection - wet scrubbing processes was developed. The work described illustrates two means of using such a theoretical model to gain valuable process insight. A series of process simulations is described. These results demonstrate how the chemistry and performance of the limestone injection - wet scrubbing process vary with important parameters. The results of a pilot scale test series are presented. Analytical methods and data analysis techniques were developed and demonstrated. In addition, a computational technique was developed for making enthalpy balances in limestone scrubbing liquors.

PB-211 749
Radiation Corp., Austin, Tex.
A STUDY OF THE LIMESTONE INJECTION WET SCRUBBING PROCESS. VOLUME II.
Final rept.,
David W. DeBerry, and Philip S. Lowell. 1 Nov 71, 111p APTD-1184
Contract CPA-70-45
See also Volume 1, PB-211 748 and Volume 3, PB-211 750.

Descriptors: (*Limestone, *Adsorbents), (*Adsorption, *Sulfur dioxide), (*Air pollution, Sulfur dioxide), Scrubbers, Mathematical models, Process control, Performance evaluation, Enthalpy, Thermodynamics, Applications of mathematics, Computerized simulation, Chemical engineering, Chemical equilibrium, Reaction kinetics.
Identifiers: *Limestone scrubbing, Alkaline scrubbing, *Air pollution control.

The volume contains three technical notes relating to the limestone injection wet scrubbing process (LIWS). The first concerns the calculation of the enthalpy of aqueous ionic solutions. It outlines the method for calculating enthalpy: The thermodynamic basis, the derivation of the equations for the difference between ideality and reference state, and the means of selecting the reference states. A comparison is made between experimental and calculated values. Next a description is presented of the Radian process model for the prototype LIWS system. This technical note presents a description of the Radian process model. A brief description of the LIWS process with regard to its relationship to the process model is followed by listing of the model assumptions and parameters. Included is a detailed description of the model. Finally equilibrium calculations for Type I APCO inhouse experiments are given. This technical note gives the results of equilibrium calculations made during analysis of data from SO2 scrubbing experiments.

PB-211 750
Radian Corp., Austin, Tex.
A STUDY OF THE LIMESTONE INJECTION WET SCRUBBING PROCESS. VOLUME III.
Final rept.

1 Nov 71, 138p APTD-1185
Contract CPA-70-45
See also Volume 2, PB-211 749.

Descriptors: (*Limestone, *Adsorbents), (*Adsorption, *Sulfur dioxide), (*Air pollution, Sulfur dioxide), Computer programs, Computerized simulation, Process control, Simulation routines, Chemical engineering, Chemical equilibrium, Thermodynamics, Concentration (Composition), Mathematical models.
Identifiers: *Limestone scrubbing, Alkaline scrubbing, *Air pollution control.

The third volume of a three volume study of the limestone injection wet scrubbing process, is presented. The computerized simulation system is conducted by a combination of three computer programs: (1) the executive section, which provides control and information on the progress of a simulation run; (2) the equipment routines which perform the calculations necessary to model the unit process operations; (3) the auxiliary section which is a collection of routines that provide special calculations for equipment routines, interface other programs and summarize the results of a run. This volume contains a description of this system, operating instructions, a technical note describing the equilibrium program used by the system, a sample data input, and program listings.

PB-211 801
Environmental Protection Agency, Rockville, Md. Office of Air Programs.
AIR POLLUTION REPORT. FEDERAL FACILITIES. METROPOLITAN ATLANTA INTRASTATE AIR QUALITY CONTROL REGION,
Wayne A. Blackard. May 71, 30p APTD-1301

Descriptors: (*Air pollution, *Georgia), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monoxide, Combustion products, Fuels, Waste disposal.
Identifiers: *Air quality data, *Federal facilities, *Atlanta (Georgia), Clayton County (Georgia), Cobb County (Georgia), DeKalb County (Georgia), Douglas County (Georgia), Fulton County (Georgia), Gwinnett County (Georgia), Henry County (Georgia).

The report presents the current sttus of the Federally owned facilities within the Metropolitan Atlanta Air Quality Control Region with regard to the implemeatation of the objectives prescribed by the Clean Air Act, as amended. The seven-county intrastate Region is located in central Georgia and consists of Clayton, Cobb, DeKalb, Douglas, Fulton, Gwinnett, and Henry counties. The data in the report are the most recently available and reflect the current fuel usage, refuse disposal practices, air pollution emissions and proposed abatement measures for the listed installations. (Author)

PB-211 853
Massachusetts Inst. of Tech., Cambridge. Dept. of Chemical Engineering.
CYCLIC OPERATION OF PLATE COLUMNS FOR GAS-LIQUID CONTACTING.
Rept. for Oct 71-May 72,
James D. Dearth, Lawrence B. Evans, and Edwin R. Gilliland. 1 May 72, 76p* EPA-R2-72-023
Contract EPA-68-02-0018

Descriptors: (*Contactors, Cyclic loads), (*Absorbers (Equipment), Cyclic loads), (*Scrubbers, Cyclic loads), (*Air pollution control equipment, Contactors), Design, Chemical engineering, Axial flow, Air flow, Liquid flow, Stead state, Head (Fluid mechanics), Hydraulics, Mixing, Mathematical models.

Previous experimental and theoretical work has indicated that the efficiency and capacity of gas-liquid contacting equipment may be improved by controlled-cycling of gas and liquid flows. The report describes a proposed program for obtaining needed information on tray hydraulics and liquid mixing, and summarizes some initial data and tentative conclusions for both steady-state and cyclic flows of an air-water system in a three-tray section of a cyclic absorber. Fluctuations in liquid-heads and interstage pressure differences; entrainment of small air bubbles in the downflowing liquid; and weepage of liquid due to liquid 'sloshing' in the gas flow period have been found to have a pronounced effect upon column hydraulics. (Author)

PB-211 888
Applied Technology Corp., Pittsburgh, Pa.
SO2 FREE TWO-STAGE COAL COMBUSTION PROCESS.
Aug 72, 55p* EPA-R2-72-035
Contract CPA-70-146

Descriptors: (*Coal, Desulfurization), (*Liquid metals, Desulfurization), (*Air pollution, *Sulfur dioxide), (*Coal gasification, *Desulfurization), Combustion products, Iron, Slags, Oxidation, Carbon monoxide, Sulfur, Electric power plants, Boilers, Coal preparation, Manufactured gas, Cost estimates, Design, Iron sulfides, Performance evaluation, Combustion chambers, Carburizing, Regeneration (Engineering), Capital costs.
Identifiers: *Air pollution control, Waste gas recovery.

A new process has been developed for removing sulfur from coal (as power plant fuel) during the combustion phase. In this process, coal is dissolved by injection into molten iron and simultaneously the dissolved coal carbon is oxidized with injected air to carbon monoxide. Under the reducing conditions existing during combustion, coal sulfur is not oxidized, but transferred from the iron to a slag consisting of coal ash and added limestone. Thus, a sulfur-free offgas is produced for use in power plant boilers. Experimental combustor studies have shown that a boiler stack gas, containing less than 50 ppm sulfur dioxide is produced. Combustor design parameters were established, and indicate that three 38-foot I.D. combustors are required for a 1000 MW plant. Laboratory work has shown the slags can be successfully desulfurized with steam to produce elemental sulfur and a H2S/SO2 gas stream suitable for additional elemental sulfur recovery in a Claus Plant. Costs are given. (Author)

PB-211 897
Aeronautical Research Associates of Princeton, Inc., N.J.
AN INITIAL TEST OF THE APPLICABILITY OF INVARIANT MODELING METHODS TO

ATMOSPHERIC BOUNDARY LAYER DIFFUSION,
Coleman duP. Donaldson, and Glenn R. Hilst. Oct 71, 64p ARAP-169 APTD-1149
Contract EPA-68-02-0014

Descriptors: (*Air pollution, *Atmospheric diffusion), Mathematical models, Mixing, Wind (Meteorology), Temperature, Turbulent diffusion, Shear stress.
Identifiers: Atmospheric boundary layer.

The study concerned the movement of air pollution in the atmosphere. With only prior knowledge of the mean wind and temperature profiles and using a relationship between the macroscale and the dissipation scale derived for laboratory scale flow, the structure of turbulence and the diffusion of matter were simulated well within an order of magnitude of observed values. In most cases, the verification is within a factor of two. Perhaps most importantly all of the classical requirements for asymptotic behavior of the diffusion were met. The predictions were somewhat more exact for neutral and unstable temperature stratification than for stably stratified atmospheres. A greater understanding of the physics of turbulent transport has been achieved and has led directly to further improvement and refinement of the model. The dependence of the scale on stability has been clarified.

PB-211 905
Environmental Protection Agency, Rockville, Md. Air Pollution Control Office.
METROPOLITAN MEMPHIS INTERSTATE AIR QUALITY CONTROL REGION.
Air pollution rept. Federal facilities,
Wayne A. Blackard. May 71, 21p APTD-1302

Descriptors: (*Air pollution, *Tennessee), (*Mississippi, Air pollution), (*Arkansas, Air pollution), National government, Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Fuel consumption, Hydrocarbons, Carbon monixide, Combustion products, Exhaust gases, Fuels, Waste disposal.
Identifiers: *Air quality data, Federal facilities, *Memphis (Tennessee), DeSoto County (Mississippi), Crittenden County (Arkansas), Shelby County (Tennessee).

The report presents the current status of the Federally owned facilities within the Metropolitan Memphis Air Quality Control Region with regard to the implementation of the objectives prescribed by the Clean Air Act, as amended. The metropolitan Memphis region encompasses portions of three states and lies within the county boundaries of: Crittenden County in the State of Arkansas, Desoto County in the State of Mississippi, and Shelby County in the State of Tennessee. The data are the most recently available and reflect the current fuel usage, refuse disposal practices, air pollution emissions and proposed abatement measures for the listed installations. (Author)

PB-211 909
Dow Chemical Co., Midland, Mich. Functional Products and Systems.
A LITERATURE SEARCH AND CRITICAL ANALYSIS OF BIOLOGICAL TRICKLING FILTER STUDIES - VOLUME I.
Water pollution control research series.

Dec 71, 330p W72-13638, EPA-17050-DDY-12/71-1
Contract FWPCA-14-12-474
See also Volume 2, PB-211 910.
Paper copy available from GPO $2.50 as EP2.10:17050DDY12/71.

Descriptors: (*Trickling filtration, *Reviews), (*Sewage treatment, Trickling filtration), (*Industrial waste treatment, Trickling filtration), History, Design, Maintenance, Performance evaluation, Research, Patents, Cost estimates, Ecology, Aerobic processes, Trickling filters, Chemical industry, Food processing, Laundries, Water pollution, Agricultural wastes, Metal industry, Drug industry, Fermentation, Paper industry, Radioactive waste processing, Textile industry.
Identifiers: Biological industrial waste treatment, Brewing industry, Military facilities, Poultry processing, Tanneries, *Water pollution control.

A two volume compilation, review and critique of the literature on biological trickling filter studies and related pollution abatement processes have been made. In the report, the literature review and critical analysis, is divided into: Introduction, definitions, history and background theory of the trickling filter process; Plant design, materials of construction, operation, maintenance and performance; Trickling filter research and development approaches, ecology, and patents, and Applications of trickling filter to specific industrial wastes. Based on the review, several general conclusions were drawn. There is no well-defined theory of design and operation. Much published work was redundant, and European efforts were not readily accepted in the United States, and vice versa. The literature reflects cycles of interest in trickling filters. The process is not applicable to all pollution problems, but its shock survival capabilities and rapid flow-through time are definite advantages which cannot be overlooked in any design of a waste treatment facility.

PB-211 910
Dow Chemical Co., Midland, Mich. Functional Products and Systems.
A LITERATURE SEARCH AND CRITICAL ANALYSIS OF BIOLOGICAL TRICKLING FILTER STUDIES - VOLUME II.
Water pollution control research series.

1972, 367P W72-13639, EPA-17050-DDY-12/71-2
Contract FWPCA-14-12-474
See also Volume 1, PB-211 909.
Paper copy available from GPO $2.75 as EP2.10:17050DDY12/71.

Descriptors: (*Trickling filtration, *Reviews), (*Sewage treatment, Trickling filtration), (*Industrial waste treatment, Trickling filtration), Bibliographies, Trickling filters, Aerobic processes.
Identifiers: Biological industrial waste treatment.

A bibliography of 5,665 references relating to biological trickling filters studies is presented. Author references are listed in alphabetical sequence based upon the surname of the author. Anonymous articles are listed after the alphabetical author sequence, according to the alphabetical sequence of the journal, and chronologically within the journal.

PB-211 916
Pacific Environmental Services, Inc., Santa Monica, Calif.
GUIDE TO ENGINEERING PERMIT PROCESSING,
Arnold Stein. Jul 72, 382p* APTD-1164
Contract CPA-70-122
Prepared in cooperation with System Development Corp., Santa Monica, Calif.

Descriptors: (*Air pollution, *Licenses), (*Industrial wastes, Air pollution), Feasibility, Regulations, Sources, Fees, Government policies, Data processing, Information retrieval, Cost effectiveness, Standards, Odors, Construction, Inspection, Equipment specifications, Air pollution control equipment, Forms (Paper), Legislation.
Identifiers: *Air pollution abatement, Air pollution control.

The Guide describes the development and administration of procedures that can be adopted to evaluate and to approve (or deny) the use of industrial equipment and processes that are capable of emitting contaminants into the general atmosphere. The Guide treats the design and administration of permit systems; engineering evaluation of the application for permit to construct; specifications, design, and operation of information systems; application of the legal prohibition to permit processing; discussion of examples of permit reviews; and engineering inspection of equipment for certificate to operate.

PB-211 917
Council on Environmental Quality, Washington, D.C.
A STUDY OF THE ECONOMIC IMPACT ON THE STEEL INDUSTRY OF THE COSTS OF MEETING FEDERAL AIR AND WATER POLLUTION ABATEMENT REQUIREMENTS. PART I. EXECUTIVE SUMMARY.

27 Jul 72, 15p*
Prepared in cooperation with Booz, Allen and Hamilton, Washington, D. C. See also Part 2, PB-211 918.
Paper copy also available from NTIS $10.00/set of 3 reports as PB-211 920-SET.

Descriptors: (*Economic factors, *Iron and steel industry), (*Pollution, Iron and steel industry), (*Industrial waste treatment, Iron and steel industry), Air pollution, Water pollution, Abatement, Cost estimates, Demand (Economics), Prices, Economic analysis, Supply (Economics), Capital costs, Profits, Employment, Trends, Shutdowns.
Identifiers: *Air pollution economics, *Water pollution economics, Economic impact, Industrial shutdowns.

This first volume presents a summary and conclusion on the potential economic impact of the costs of meeting Federal air and water pollution abatement requirements for the steel industry.

PB-211 918
Council on Environmental Quality, Washington, D.C.
A STUDY OF THE ECONOMIC IMPACT ON THE STEEL INDUSTRY OF THE COSTS OF MEETING FEDERAL AIR AND WATER POLLUTION ABATEMENT REQUIREMENTS. PART II. THE STRUCTURE OF THE STEEL INDUSTRY.

27 Jul 72, 103p
Prepared in cooperation with Booz, Allen and Hamilton, Washington, D.C. See also Part 1, PB-211 917 and Part 3, PB-211 919.
Paper copy also available from NTIS $10.00/set of 3 reports as PB-211 920-SET.

Descriptors: (*Economic factors, *Iron and steel industry), (*Pollution, Iron and steel industry), (*Industrial waste treatment, Iron and steel industry), Air pollution, Water pollution, Abatement, Trends, Economic analysis, Prices, Marketing, International trade, Competition, Profits, Design, Air pollution control equipment, Industrial wastes.
Identifiers: *Air pollution economics, *Water pollution economics, Economic impact.

The report concerns the potential economic impact of the costs of meeting Federal air and water pollution abatement requirements on the steel industry. The volume evaluates the steel industry's growth patterns, operating practices, and competitive environment. It assesses recent steel industry's financial performance and describes the process of making steel. Significant pollutants generated at each production stage are identified along with abatement techniques to control them.

PB-211 919
Council on Environmental Quality, Washington, D.C.
A STUDY OF THE ECONOMIC IMPACT ON THE STEEL INDUSTRY OF THE COSTS OF MEETING FEDERAL AIR AND WATER POLLUTION ABATEMENT REQUIREMENTS.

PART III.

27 Jul 72, 135p
Prepared in cooperation with Booz, Allen and Hamilton, Washington, D. C. See also Part 2, PB-211 918.
Paper copy also available from NTIS $10.00/set of 3 reports as PB-211 920-SET.

Descriptors: (*Economic factors, *Iron and steel industry), (*Pollution, Iron and steel industry), (*Industrial waste treatment, Iron and steel industry), Air pollution, Water pollution, Abatement, Demand (Economics), Trends, Economic forecasting, Cost estimates, Capital costs, Profits, Employment, Shutdowns, Economic analysis, Financing.
Identifiers: *Air pollution economics, *Water pollution economics, Economic impact, Industrial shutdowns.

The impact of air and water pollution controls on the steel industry is presented. This volume discusses the following areas: Steel demand and probable shipment 1972-1976; Domestic steel production capacity; Steel industry capital investment requirements 1972-1976; Pollution abatement costs; The impact of pollution abatement costs on industry growth and profits; and Potential regional employment impact.

PB-211 960
Council on Environmental Quality, Washington, D.C.
ENVIRONMENTAL QUALITY ANNUAL REPORT (3RD) OF THE COUNCIL ON ENVIRONMENTAL QUALITY.
Rept. for 1971-72.

Aug 72, 475p
Paper copy available from GPO $2.00 as stock no. 4111-0011.

Descriptors: (*United States, *Pollution), (*Air pollution, United States), (*Water pollution, United States), Reviews, Evaluation, Water quality, Land use, Wildlife, Indicator species, Forecasting, Trends, Environmental surveys, Demography, Economic analysis, Natural resources, Socioeconomic status, International relations, Oceans, Government policies, Radioactive contaminants, Public health, Abatement, Materials recovery, Decision making, Cost estimates, Industrial wastes, Waste disposal, Noise reduction.
Identifiers: *Solid waste disposal, *Noise pollution, Air quality, Endangered species, Air pollution abatement, Water pollution abatement, National Environmental Policy Act, National Parks, Economic impact.

The report emphasizes both status of and trends in environmental quality. It discusses the interrelationships of population, technology, pollution, and other factors that will shape our future environment. Discussed are this year's major developments at the international level and specific substantive issues such as the international trade effects of environmental controls. Coverage of developments at Federal and State levels has been extended to the local level, with a case study of local efforts to control noise. Included is an update of last year's cost figures and a description of impacts of pollution control costs on 14 industries as well as on the overall economy. The report contains a comprehensive analysis of NEPA (National Environmental Policy Act) and a discussion of the National Parks. (Author)

PB-211 961
National Research Council, Washington, D.C. Committees on Pollution Abatement and Control.
ABATEMENT OF PARTICULATE EMISSIONS FROM STATIONARY SOURCES.

1972, 56p* COPAC-5 EPA-R2-72-042
Contract CPA-70-48

Descriptors: (*Air pollution, *Particles), (*Government policies, Particles), Forecasting, Trends, Abatement, Sources, Air pollution control equipment, Dust control, Gas filters, Cost estimates, Industrial wastes, Gas sampling, Particle size, Reviews.
Identifiers: *Air pollution control.

A program of government and industry research for dealing with particulate emissions is outlined. This program is based on an evaluation of current technology and an assessment of what developments in control and measurement techniques can reasonably be expected during the next five to ten years. The report identifies and summarizes technical problems in which a six-point program for improving particulate-emission control is proposed. The background and scope of the study are discussed. Emission sources and particle collection technology are also reviewed. The two remaining include discussions of the measuring and monitoring of particle concentrations and of the characteristics of fine particles. (Author)

PB-211 968
National Environmental Research Center, Cincinnati, Ohio. Analytical Quality Control Lab.
METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES.

1971, 298p W72-04735, EPA-16020-07/71
Paper copy available from GPO $3.00 as EP2.10:16020-07/71.

Descriptors: (*Water analysis, *Handbooks), (*Water pollution, Water analysis), (*Sewage, Water analysis), (*Industrial wastes, Water analysis), Acidity, Alkalinity, Arsenic, Biochemical oxygen demand, Chlorides, Color, Cyanides, Dissolved gases, Oxygen, Fluorides, Metals, Trace elements, Mercury, Nitrogen, Oils, Dissolved organic matter, Phenols, Phosphorus, Selinium, Solids, Sulfates, Sulfides, Odors, Water quality, Turbidity.
Identifiers: *Water pollution detection, Chemical oxygen demand, Acetic acid/nitrilo-tri.

The handbook describes chemical analytical procedures to be used in Water Quality Office (WQO) laboratories. Except where noted under 'Scope and Application' for each constituent, the methods can be used for the measurement of the indicated constituent in both water and wastewaters and in both saline and fresh water samples. Instrumental methods have been selected in preference to manual procedures because of the improved speed, precision, and accuracy. Procedures for the Technicon AutoAnalyzer have been included for laboratories having this equipment available.

PB-212 007
Environmetrics, Inc., Washington, D.C.
THE BASIN MODEL: CHAIRMAN AND COUNCIL.
Water pollution control research series.

Dec 71, 86p W72-13930, EPA-16110-FRU-12/71-5
Contract FWPCA-14-12-959
Paper copy available from GPO $0.70 as EP2.10:16110 FRU 12/71-5.

Descriptors: (*River basin development, *Decision making), (*Regional planning, River basin development), Computerized simulation, Interactions, Gaming models, Water resources, Water quality, Allocations, Local government, Economic analysis, Demography, Socioeconomic status, Management.
Identifiers: River Basin Model, *Water pollution abatement.

The RIVER BASIN MODEL is a man-machine simulation model used to delineate the interactions taking place, within a real or hypothetical area, between the local water system and the economic, social and governmental activities of that area; it is a model of an entire regional system, with water a subsystem realistically interacting with all the other major subsystems, such as housing and transportation. A gaming format is employed. The Governmental (provides public services) Sector and the model required by its Chairman team, and the computer printed output are described. Each political jurisdiction has a chief executive called the Chairman. The report describes the functions of the Chairman in this simulation. The Chairman makes departmental appointments to the local government departments, and he sets budget policy decisions. His office is an elected one, and periodic elections are held in which the members of the Social Sector vote for nominated candidates.

PB-212 008
California Univ., Los Angeles. Graduate School of Management.
EXTENSIONS OF MATHEMATICAL PROGRAMMING FOR REGIONAL WATER QUALITY MANAGEMENT.
Water pollution control research series,
G. Graves. Apr 72, 88p W72-13931, EPA-16110-EGQ-04/72
See also report dated Aug 70, PB-195 830.
Paper copy available from GPO $1.00 as EP2.10:16110EGQ04/72.

Descriptors: (*Water quality, *Mathematical programming), (*Regional planning, Water quality), (*Water pollution, Mathematical programming), Management planning, Stream pollution, Dissolved gases, Oxygen, Sewage treatment, Aeration, Reservoirs, Stream flow, Mathematical models, Matrices (Mathematics), Bypasses, Financing, Taxes, Expenses, Cost estimates, Nonlinear programming.
Identifiers: *Water pollution abatement, Water pollution taxes (Charges), Sewer surcharges.

The objective of the research was to develop a general practical planning tool to provide optimal solutions for the complex choices involved in balancing alternative methods for attaining water quality goals. Extended is the earlier work, 'Mathematical Programming for Regional Water Quality Management'. A mixed integer, continuous variable non-linear programming model is developed which promises to be much more realistic and effective in selecting an optimal configuration of regional treatment plants and pipe juncture nodes. A new Bender's type decomposition for the non-linear model is also presented as an appropriate and feasible solution technique. The dissolved oxygen profile and the control options were linked. The work shows how the transfer coefficients can be recalculated periodically in the course of the system optimization. The theoretical framework for including two additional treatment methods, mechanical re-aeration and flow augmentation via reservoirs is also developed.

PB-212 097
Mechanical Technology, Inc., Latham, N.Y.
FEASIBILITY ANALYSIS OF THE TRANSMISSION FOR A FLYWHEEL/HEAT ENGINE HYBRID PROPULSION SYSTEM.

Nov 71, 239p MTI-71TR75 APTD-1181
Contract EPA-68-04-0033

Descriptors: (*Automotive transmissions, Performance evaluation), (*Passenger vehicles, Hybrid propulsion), Internal combustion engines, Flywheels, Hydraulic couplings, Mechanical drives, Feasibility, Cost analysis, Safety factor, Air pollution, Fuel consumption.

A study was conducted to quantitatively assess the practicality, from both a performance and cost viewpoint, of a transmission that will meet the requirements of a flywheel/heat engine hybrid propulsion system for a family car. The scope of the study included: consideration of various types of feasible transmissions; selection of candidate

transmission, detailed performance and controls analysis of the candidate transmission; and lastly, a detailed cost analysis of the transmission. The heat engine considered in the study was a standard internal combustion engine typica. used in present-day, medium sized, family cars. (Author)

PB-212 231
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
GUIDE FOR COMPILING A COMPREHENSIVE EMISSION INVENTORY.
Jun 72, 202p* APTD-1135

Descriptors: (*Air pollution, Data retrieval), Data handling, Inventories, Data processing, Sources, Instruction manuals, Geography, Populations, Computer systems programs, Coding, Waste disposal, Data acquisition, Industrial wastes, Combustion products, Hazardous materials, State government, Local government, Fuels, Evaporation, Exhaust gases.
Identifiers: Emission factors, Solid waste disposal.

The manual describes, in detail, procedures for obtaining and codifying information about air pollutant emissions from stationary and mobile sources. Automatic data processing, charts, and maps are discussed as presentation techniques, and a step-by-step description of data acquisition is provided. The system has been developed specifically for use by state and local air pollution control agencies. A uniform coding system for the data is encouraged. Detailed procedures are given concerning the information to be gathered from each source, the methods to be used to gather the information, the codes to be used to simplify the information on standard coding forms, the geographical and population information needed about the area of interest, the apportionment techniques and emission factors needed, and the methods of displaying the data. (Author)

PB-212 267
Montgomery County Sanitary Dept., Dayton, Ohio.
GROUND WATER INFILTRATION AND INTERNAL SEALING OF SANITARY SEWERS, MONTGOMERY COUNTY, OHIO.

Jun 72, 76p W72-14441, EPA-11020-DHQ-06/72
Paper copy available from GPO $0.75 as EP2.10:11020 DHQ 06/72.

Descriptors: (*Sanitary sewers, Fluid infiltration), Seepage, Sealing, Joint sealers, Joints (Junctions), Television equipment, Inspection, Flow rate, Maintenance, Water pollution, Abatement.
Identifiers: Storm water runoff, Illegal sewer connections, Water pollution abatement.

A program for pollution abatement was undertaken to study the effects of infiltration reduction in sanitary sewers by joint sealing and to study closed circuit television techniques. Water pollution from municipal wastewater treatment plants would be reduced if peak flows from rainfall could be reduced. The study evaluates the effects of remedial repairs to joints by use of pressure grouting of small main line sewers. A minimal measurable amount of quantity flow reduction was attributed to the sewer sealing program. Infiltration from extraneous storm water, illegal connections, and basement underdrains seem to outweigh the contribution due to leaky joints to such a degree that reduction due to joint sealing was obscured. The study does show the significance of internal television system as an inspection and maintenance tool. This information on costs, operation, and procedure is of value to anyone interested in this field. (Author)

PB-212 280
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
NITROGEN REMOVAL FROM WASTEWATERS.

Oct 70, 32p* W72-14650, EPA-WQO-17010-10/70
Supersedes report dated May 70, PB-206 306.

Descriptors: (*Chemical removal (Sewage treatment), *Nitrogen), (*Sewage treatment, Chemical removal (Sewage treatment)), (*Water pollution, *Nitrogen inorganic compounds), Reviews, Inorganic nitrates, Ammonia, Nutrients, Activated sludge process, Stripping (Distillation), Cost estimates, Ion exchanging, Biodeterioration, Nitrification, Chlorination.
Identifiers: Denitrification, *Water pollution control.

Classically, sewage treatment has been directed toward the removal of suspended solids, biochemical oxygen demand and reduction of bacterial contaminants. Removal of nutrients such as phosphorus and nitrogen has been incidental to treatment processes. The rapid increase in severe eutrophication problems in recent years has focused attention on nutrient control from municipal sources. The report provides a state of the knowledge on nitrogen removal. The contents include: Nitrogen removal from wastewaters--statement of the problem; Nitrogen removal by biological suspended growth reactors; Nitrogen removal by column reactors; Ammonia nitrogen removal by stripping with air; Removal of ammonia nitrogen by selective ion exchange; Ion exchange for nitrate removal; Other methods for removing nitrogen; Salt Creek two state nitrification plant.

PB-212 359
Clemson Univ., S.C. Dept. of Textiles.
STATE OF THE ART OF TEXTILE WASTE TREATMENT.
Water pollution control research series rept.

Feb 71, 356p W72-14827, EPA-WQO-12090-ECS-02/71
Paper copy available from GPO $2.50 as EP2.10:12090-ECS-02/71.

Descriptors: (*Textile industry, *Industrial waste treatment), (*Water pollution, *Industrial wastes), Reviews, Bibliographies, Inventories, Synthetic fibers, Natural fibers, Lagoons (Ponds), Activated sludge process, Trickling filtration, Detergents, Dyes, Sludge disposal, Industrial engineering, Cost estimates, Legislation, State government, Government policies, Textile finishing, Sizing materials, Cotton fabrics, Woolen textiles, Rayon, Acetate fibers, Polyester fibers, Acrylic fibers, Public law.
Identifiers: *Water pollution control, Biological industrial waste treatment, Tertiary sewage treatment, Water pollution abatement.

A study has been made of waste treatment methods and practices used in the textile industry. Information was obtained from people working in the textile processing industry, designing waste treatment plants, and enforcing state and federal regulations on waters discharged to streams and natural reservoirs. To supplement this information the literature was reviewed and an annotated bibliography prepared. The report contains sections on the following: characteristics of textile waste, waste treatment techniques, treatment methods in use, effects of textile wastes on receiving waters, the cost of waste treatment operations, and state and federal regulations governing discharge waters. Areas of needed research are recommended. The annotated bibliography contains references on synthetic fiber manufacturing wastes, detergent waste treatment, instrumentation, plant design, water treatment for plant use as well as articles pertaining specifically to textile waste treatment.

PB-212 369
Engineering-Science, Inc./Texas, Austin.
PRELIMINARY INVESTIGATIONAL REQUIREMENTS - PETROCHEMICAL AND REFINERY WASTE TREATMENT FACILITIES.
Water pollution control research series.

Mar 71, 203p W72-14852, EPA-12020-EID-03/71
Contract FWPCA-14-12-588
See also PB-205 824
Paper copy available from GPO $1.50 as EP2.10: 12020 EID 03/71 and stock no. 5501-0089.

Descriptors: (*Industrial waste treatment, *Chemical industry), (*Refineries, Industrial waste treatment), Industrial engineering, Petrochemistry, Water pollution, Industrial wastes, Water flow, Water analysis, Dissolved organic matter, Biochemical oxygen demand, Trickling filtration, Design criteria, Lagoons (Ponds), Stripping (Distillation), Electrodialysis, Ion exchanging, Osmosis, Digesters, Coagulation, Activated carbon, Aeration, Sludge disposal, Sludge drying, Chlorination, Aerobic processes, Anaerobic processes.
Identifiers: *Petrochemical industry, *Water pollution control, Chemical oxygen demand, Biological industrial waste treatment, Reverse osmosis, Tubular membranes, Solid waste disposal.

The purpose of the report is to compile and organize the many components which constitute a preliminary waste water treatability study for the refinery and petrochemical industry. Case studies indicate that locating, analyzing, and properly interpreting the nature of pollutional sources within a petrochemical of refinery complex is the basis from which a treatability study can be developed. Each of the wastewaters including normal process and utility effluent, contaminated storm runoff, ballast water discharge, and other related sources of wastewater, must be properly characterized with respect to their organic and inorganic constituents. The treatability study must be programmed to yield definitive information concerning pollutional removal rates, anticipated levels of residual or non-removable constituents, and treatment process requirements.

PB-212 370
Environmental Measurements, Inc., San Francisco, Calif.
MONITORING MERCURY VAPOR NEAR POLLUTION SITES.
Water pollution control research series.

May 71, 65p W72-14714, EPA-16020-GLY-05/71
Paper copy available from GPO $0.70 as EP2.10:16020 GLY 05/71.

Descriptors: (*Mercury, *Spectrochemical analysis), (*Air pollution, Mercury), (*Water pollution, Mercury), Sources, Monitors, Water analysis, Gas analysis, Spectrometers, Atomic spectroscopy, Industrial wastes, Field tests, Mercury ore deposites, Geysers.
Identifiers: *Atomic absorption spectroscopy, *Water pollution detection, *Air pollution detection.

Field and laborstory measurements were made to demonstrate that mercury vapor in the air near mercury-polluted water or sediment can be detected using an extremely sensitive detector, the Barringer Airborne Mercury Spectrometer. Areas were visited where the presence of mercury was known from fish, water, or sediment analyses; anomalous mercury levels ranging from 50 to more than 20,000 nanograms per cubic meter were detected. Anomalous concentrations of atomic mercury vapor in air may be classified as natural or man-made. Laboratory studies demonstrated that the mercury spectrometer is sensitive only to atomic mercury. By means of pyrolysis or combustion, organic compounds could be detected. To detect mercury pollution in water, pyrolysis appears necessary to convert combined mercury to the atomic state for measurement by rapid spectrophotometric techniques.

PB-212 374
Robert A Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
MOBILE PILOT PLANT FOR REMOVAL OF PHOSPHATE FROM WASTEWATERS BY ADSORPTION ON ALUMINA.
Water pollution control research series,
L. L. Ames, Jr. Jun 70, 39p W72-14789, FWQA-17010-EER-06/70
Contract FWPCA-14-12-566

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Sewage treatment, Chemical removal (Sewage treatment)), (*Aluminum oxides, *Adsorbents), Inorganic phosphates, Pilot plants, Performance evaluation, Columns (Process engineering), Desorption, pH control, Precipitation (Chemistry), Operating costs, Cost estimates, Water reclamation, Regeneration (Engineering), Calcium hydroxides.
Identifiers: Tertiary sewage treatment.

Alumina, a phosphorus-selective adsorbent, was used in a tertiary chemical process for phosphorus removal. A mobile pilot plant designed and built on the basis of laboratory results was fitted into a standard forty-foot van trailer. The secondary effluent was passed through a thirty inch multimedia filter bed and stored. Then the filtered sewage was pumped through one or more of three alumina beds approximately forty inches in depth and three feet in diameter. Phosphorus loading of the alumina columns can be in a downflow or upflow direction with the columns in series or parallel. NaOH was recirculated to remove absorbed phosphorus in an alumina column taken off the line. Valving and column washing was pH controlled. Ca (OH)2 as added to the NaOH solution in a mixing tank to precipitate phosphorus in the form of hydroxyapatite. The solids were removed in a continuous centrifuge and the Na (OH) returned for reuse. Initial operating costs are reported. (Author)

PB-212 389
O'Brien and Gere Engineers, Inc., Syracuse, N.Y.
EQUALIZATION OF WASTEWATER FLOWS.
Michael D. LaGrega. Mar 72, 54p W73-0006, EPA-R2-72-075
FWPCA-14-12-598

Descriptors: (*Sewage treatment, Water flow), Flow rate, Steady state, Balancing, Diurnal variations, Design criteria, Tanks (Containers), Performance evaluation, Process control, Forecasting, Statistical analysis.
Identifiers: *Sewage flow rates, Sewage treatment plants.

The diurnal variability of waste flow and waste strength entering wastewater treatment facilities has important ramifications in the design and operation of both conventional and advanced waste treatment plants. Results are presented of a full scale (2 mgd) study of the effects of maintaining a constant flow of wastewater into a sewage treatment plant through the use of an equalization tank. The study was conducted at the Newark, New York Water Pollution Control Facilities.

PB-212 392
Dynatech R/D Co., Cambridge, Mass.
A SURVEY OF ALTERNATE METHODS FOR COOLING CONDENSER DISCHARGE WATER SYSTEM, SELECTION, DESIGN, AND OPTIMIZATION.
Water pollution control research series.

Jan 71, 114p W72-14724, EPA-16130-DHS-01/71
Contract FWPCA-12-14-477
Paper copy available from GPO $1.00 as stock no. 5501-0142.

Descriptors: (*Cooling systems, *Thermal power plants), Cost analysis, Computer programs, Design, Cooling water, Cooling towers, Optimization.

A computer program was written to calculate cooling system and power plant cost and to determine the minimum total cost for a given set of parameters. Design equations based on the use of water cooled condensers, cooling towers, open cooling systems, operation of the power plant and the cooling system at various ambient conditions or even operation of the power plant at up to five off-design capacities have been provided for in the computer program, through which the minimum total cost is calculated. (Author)

PB-212 393
Battelle Columbus Labs., Ohio.
CORROSION POTENTIAL OF NITRILOTRIACETIC ACID (NTA) IN DETERGENT FORMULATIONS.
Water pollution control research series,
P. I. Moreland, W. K. Boyd, and G. A. Lutz. Apr 71, 106p W72-14851, EPA-16080-GPF-04/71
Contract FWPCA-14-12-943
Paper copy available from GPO $1.00 as stock no. 5501-0093.

Descriptors: (*Detergents, *Corrosion), (*Plumbing, Corrosion), Amines, Sodium phosphates, Stainless steels, Nickel alloys, Brasses, Copper, Aluminum alloys, Zinc, Carbon steels, Lead, Cast iron, Corrosion tests.
Identifiers: *Acetic acid/nitrilo-tri, Steel 304, Steel 420, Aluminum alloy 1100, Nickel alloy 201, Steel 1020, Triphosphoric acid/ (pentasodium-salt).

Laboratory studies were conducted to determine the corrosion potential of nitrilotriacetic acid (NTA) as a substitute for sodium tripolyphosphate (STPP) in detergents. Coupon-weight loss and linear polarization studies were employed to investigate the corrosion of typical materials of construction which might be subject to exposure to NTA in normal use in laundering. Detergent formulations used were representative of heavy-duty granular detergents. Corrosion was generally greatest in NTA and STPP solutions with soft water. Tested were types 304 and 420 stainless steel, 201 nickel, 260 brass, electrolytic copper, 1100 aluminum, die-cast zinc, 1020 carbon steel, chemical lead, and cast iron. NTA detergents could increase metal ion pickup at a sewage plant by a factor between 1 and 7.

PB-212 394
National Canners Association, Berkeley, Calif. Western Research Lab.
RECONDITIONING OF FOOD PROCESSING BRINES.
Water pollution control research series.

Mar 71, 77p W72-14919, EPA-12060-EHU-03/71
Grant WPRD-134-01-68
Paper copy available from GPO $0.75 as stock no. 5501-0092.

Descriptors: (*Food processing, *Industrial waste treatment), (*Brines, Industrial waste treatment), (*Water reclamation, Industrial waste treatment), Activated carbon, Canning, Regeneration (Engineering), Cost estimates, Capital costs, Waste disposal, Performance engineering.
Identifiers: *Olive processing, Water pollution control.

Activated carbon was used to treat storage brines and processing waters obtained from the production of canned ripe olives and glass packed green olives. Reconditioned brines were evaluated for reuse potential. Freshly harvested olives can be stored for commercially significant periods in reconditioned storage brines. Olives stored in reconditioned brine were of good quality. There was no detectable effect on final product quality with the reuse of reconditioned brines of lower salt content. When capital costs are amortized over 10 years for a cannery storing 5,000 tons of olives annually, estimates for commercial application of activated carbon treatment of storage brines show a cost per ton of olives stored of $3.64. Ten olive canneries sending spent carbon to a centrally located reactivation facility would have a cost of $1.28 per ton of olives stored. (Author)

PB-212 398
Humboldt County Dept. of Public Works, Eureka, Calif.
RURAL STORAGE AND COLLECTION CONTAINER SYSTEMS.
Interim rept. 1 Jun 70-31 Oct 71.

1972, 155P EPA-SW-41D.I-72
Grant G06-EC-00271
Prepared in cooperation with Garretson-Elmendorf-Zinov-Reibin, Consultants.

Descriptors: (*Refuse disposal, *Containers), Storage, Project planning, Rural areas, Collecting methods, Earth fills, Cost analysis, California.
Identifiers: *Solids waste disposal, Humbolt County (California).

The objective of the project was to demonstrate and evaluate two alternative refuse storage and collection container systems for small isolated rural areas, with special emphasis on costs, workability, and community acceptance. The test area for the project is to be the southern one-third of Humboldt County, California, with a population of approximately 10,000 people. In the first system, waste will be deposited in a 40-cu-yd, roll-off container that can be picked up and hauled to the central sanitary landfill. In the second system, waste will be deposited in 8-cu-yd containers. These containers will be emptied at the site into a 42-cu-yd collection vehicle that will then proceed to the next container site or, if full, to the landfill. The interim report details the selection of collection equipment (both containers and vehicles) components, and the development of test procedures for evaluating the storage and collection systems.

PB-212 421
American Process Equipment Corp., Hawthorne, Calif.
ULTRASONIC FILTRATION OF COMBINED SEWER OVERFLOWS.

Jun 70, 50p W73-00070, EPA-WQO-11023-DZF-06/70
Contract EPA-14-12-195
Paper copy available from GPO $0.60 as stock no. 5501-0071.

Descriptors: (*Sewage filtration, *Ultrasonic radiation), (*Sewage treatment, Sewage filtration), Combined sewers, Overflows, Cleaning, Maintenance, Plugging, Biochemical oxygen demand, Polyethylene resins, Performance evaluation.

Simulated combined sewer overflows and primary treatment plant effluent were used to test a 250,000 gpd compact ultrasonically cleaned microfiltration system composed of twenty porous polyethylene elements of 0.8 sq. ft. area each. Study indicates that the use of more costly porous stainless steel elements would alleviate the clogging of filters. Filter clogging at the Atlanta, Georgia test site prevented showing the feasibility of treating combined sewer overflows. In more suitable water pollution control applications, it is possible to reduce BOD and suspended solids in raw settled sewage, or effluents from primary and secondary plants by 50%, using ultrasonic filtration and having initial levels of influent BOD and suspended solids of 100 mg/l or less. A vortex separator was designed as a pretreatment device for the filter.

PB-212 422
Hydroscience, Inc., Westwood, N.J.
THE IMPACT OF OILY MATERIALS ON ACTIVATED SLUD SYSTEMS.
Mar 71, 120p W73-00081, EPA-WQO-12050-DSH-03/71

Paper copy available from GPO $1.25 as stock no. 5501-0088.

Descriptors: (*Sewage treatment, Oils), (*Activated sludge process, *Oils), Biodeterioration, Lubricating oils, Crude oils, Vegetable oils, Emulsification, Performance evaluation, Coagulation, Adsorption, Flotation, Filtration.
Identifiers: Oil wastes.

The performance of small scale continuous activated sludge systems was observed after being exposed to a variety of oily compounds such as crankcase oil, crude oil and vegetable oil, at several loading levels. Batch studies were conducted to determine biodegradability and the effect of emulsification and temperature on the rate of biological reaction. Oils are absorbed on the floc and slowly degrade when they are introduced into an activated sludge system. The oil accumulates on the sludge causing a loss of density and acceptable settling characteristics if the loading rate is higher than the degradation wastage. The ability of the microbial system to remove other substrates is not inhibited although the biological system fails due to the loss of sludge. (Author)

PB-212 423
Environmental Measurements, Inc., San Francisco, Calif.
SO2 AND NO2 MEASUREMENTS METROPOLITAN LOS ANGELES, CALIFORNIA, 13-16 JULY, 1971.

Aug 71, 46p APTD-1148
Contract EPA-6H-02-0124

Descriptors: (*Infrared detection, *Air pollution), (*Gas detectors, Infrared detectors), Field tests, Sulfur dioxide, Nitrogen dioxide, California, Spectroscopic analysis, Infrared spectrometers, Remote sensing.
Identifiers: *Air pollution detection, *Los Angeles (California).

Independent remote sensing data were desired for comparison with tests of infrared remote sensors. A dual-gas correlation spectrometer was used to measure sulfur dioxide (SO2) and nitrogen dioxide (NO2) simultaneously. Data which were gathered in Metropolitan Los Angeles is presented.

PB-212 478
Research Triangle Inst., Durham, N.C.
A STUDY OF CORRELATIONS OF OZONE AND SULFUR DIOXIDE.
Final rept.,
L. F. Ballard, and L. K. Matus. Sep 72, 16p RTI-41U-98-93 EPA-R3-72-013
Contract EPA-68-02-0257

Descriptors: (*Air pollution, *Sulfur dioxide), (*Ozone, Air pollution), Correlation, Tables (Data), Urban areas, Linear regression, Diurnal variations, Missouri, California, Concentration (Composition).
Identifiers: Air quality data, Saint Louis (Missouri), Los Angeles (California).

The report describes the results of a data analysis study to determine the correlation between ozone (O3) and sulfur dioxide (SO2) concentrations in ambient air using data that had been obtained in Los Angeles and St. Louis. Sulfur dioxide concentrations were determined by the flame photometer detector method. Ozone concentrations were determined by the chemiluminescent reaction between ozone and ethylene. Not having an established gas phase reaction model as a basis for relating SO2 and O3 in this study, a series of simple linear regressions were performed to test or determine the significance of a relationship if it exists. Data sets consisted of hourly averages obtained at the same time each day. (Author)

PB-212 530
Stanford Research Inst., Menlo Park, Calif.
STUDY OF LASER BACKSCATTER BY PARTICULATES IN STACK EMISSIONS.
Final rept.,
Edward E. Uthe, and Charles E. Lapple. Jan 72, 158p EPA-R2-72-089
Contract CPA-70-173

Descriptors: (*Air pollution, *Optical radar), (*Detectors, *Particles), (*Smoke, Detectors), Chimneys, Plume detection, Fly ash, Optimization, Backscattering, Tests, Design criteria, Light scattering, Remote sensing, Particle size, Opacity, Reflectance, Concentration (Composition).
Identifiers: *Air pollution detection, Mie scattering.

The validity of determining smoke plume opacity or particulate content from measurements of the backscatter of laser radiation from plume particulates was investigated. The backscatter experiments were conducted with the use of a specially designed aerosol chamber that allowed the experimental geometry to simulate that associated with actual remote plume probing. Raw fly ash collected from a bituminous coal burning power plant was classified into various size fractions and pneumatically injected into the chamber at controlled concentrations. The aerosol was continuously monitored by a white light transmissometer along the axis of the chamber. Lidar measurements were made to determine the backscatter and transmission of the generated aerosols. These results for fly ash indicate that plume opacity may be determined from lidar backscatter measurements at 0.7 microns wavelength, but that mass concentration is better inferred from 1.06 microns lidar backscatter measurements. (Author)

PB-212 554
Dow Chemical Co., Midland, Mich. Analytical Labs.
STUDY OF AIR POLLUTANTS BY MICROWAVE SPECTROSCOPY.
Final rept.,
George F. Crable. Jun 72, 75p EPA-R2-72-093
Contract CPA-22-69-144

Descriptors: (*Air pollution, *Microwave spectroscopy), (*Gas analysis, Microwave spectroscopy), Spectrometers, Quantitative analysis, Microwave spectra, Saturation, Qualitative analysis, Performance evaluation, Ammonia, Sulfur dioxide, Formaldehyde, Nitrogen dioxide, Thiols, Acetone.
Identifiers: Carbonyl sulfide.

The results and evaluations of experiments conducted to evaluate the usefulness of microwave spectroscopy as an analytical tool for air contamination studies are discussed. The background and theory as applied to analytical applications are presented. The following three possible analytical procedures are discussed in detail: Optimum power saturation method; Line areas; and Line intensities. (Author)

PB-212 560
Shell Development Co., Emeryville, Calif.
AFTERBURNER SYSTEMS STUDY,
R. W. Rolke, R. D. Hawthorne, C. R. Garbett, E. R. Slater, and T. T. Phillips. Aug 72, 512p* S-14121 EPA-R2-72-062
Contract EPA-EHSD-71-3

Descriptors: (*Afterburners, *Air pollution control equipment), (*Catalytic converters, Afterburners), Handbooks, Flames, Decomposition, Hydrocarbons, Odors, Carbon monoxide, Particles, Flue gases, Performance evaluation, Furnaces, Heat recovery, Construction materials, Corrosion, Cost estimates, Combustion, Combustion products, Reaction kinetics.
Identifiers: *Air pollution control, *Thermal afterburners.

The results are presented of a study of afterburner or fume incinerator technology for control of gaseous combustible emissions from stationary sources. The scope of the study included evaluation of current engineering technology, evaluation of existing afterburner systems, assessment of present practices and problems, determination of major sources and potential applications, and development of research recommendations. The main results of the study are presented as a handbook, allowing the potential user to be able to decide if his particular emission is amenable to afterburning and to obtain a rough estimate of cost and size of equipment needed. The user will also be made aware of potential problems and recommended design features. (Author)

PB-212 561
Nevada Univ., Reno. Center for Water Resources Research.
STUDIES OF TRACE ELEMENTS IN SOILS AND PLANTS FROM THE FOUR CORNERS AREA OF NEW MEXICO.
Project rept. no. 20 (Final), 6 Apr-30 Jun 72,
Nellie B. Stark, and Patricia F. Harris. 1 Sep 72, 96p EPA-R4-72-007
Contract EPA-68-02-0269

Descriptors: (*Air pollution, Trace elements), (*Electric power plants, Air pollution), (*Fly ash, *Trace elements), Environmental surveys, Soil analysis, Plants (Botany), Sampling, Concentration (Composition), Arsenic, Beryllium, Cadmium, Chromium, Fluorides, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, New Mexico.

A study was initiated as a result of the need to develop background and preliminary data on the environmental effects of coal-fired power plants. The objective of the study was to measure the concentration of eleven trace elements in plants and soils in the Four Corners area of New Mexico. Selection of the elements was made on the basis of data obtained from a survey on the chemical make-up of the fly ash emitted by the power plants in this location. These eleven elements are: As, Be, Cd, Cr, F, Pb, Mn, Hg, Mo, Ni, Se. Some of the elements studied, such as mercury, lead and selenium, are known to be toxic to animals in relatively low concentrations. This study, by sampling plants and soils in two different locations, attempted to develop preliminary data on the potential buildup of each trace element. (Author)

PB-212 562
North Star Research and Development Inst., Minneapolis, Minn.
A SURVEY OF RECENT LITERATURE RELEVANT TO OPTIMIZING THE BENEFITS OF YOUTH PROJECTS FOR RURAL YOUTH IN THE SOUTHEASTERN STATES.
Final rept.,
Barbara M. Rogoff, William J. Schneider, and Guy H. Miles. Aug 72, 58p* DLMA-41-2-001-27
Contract DL-41-2-001-27

Descriptors: (*Youths, Rural areas), (*Socioeconomic status, *Southern states), Reviews, Demographic surveys, Economic surveys, Ethnic groups, Employment, Adjustment (Psychology), Hypotheses, Population migrations, Social change, Education, Industrial training, Manpower utilization, Projects, Evaluation, Statistical data, Optimization.
Identifiers: Benefits.

A review was made of more than 140 publications which deal with the occupational and social adjustment of rural youths in the Southeastern region. This review focuses on publications that concern the changing economic environment of rural youths, their migration patterns, their educational system, their participation in federal manpower programs, and their occupational and social adjustment.

PB-212 589
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.

EVALUATION OF A MULTI-FUNCTIONAL MACHINE FOR USE IN SANITARY LANDFILL OPERATIONS IN SPARSELY POPULATED AREAS.
Final rept.,
V. L. Hammond. 1972, 218p* EPA-SW-39d-72
Grant G06-EC-00210

Descriptors: (*Earth handling equipment, Evaluation), (*Waste disposal, *Earth fills), Front end loaders, Bulldozers, Soil compacting, Chassis, Overhauling, Benefit cost analysis, Idaho, Oregon.
Identifiers: *Solid waste disposal, Sanitary landfills.

The report gives details of an investigation made of a multi-functional machine, known as the Multi-Mover, which was originally designed to perform the functions of a crawler tractor/dozer, dump truck, compactor, and loader. Its performance in accomplishing sanitary landfill and earthmoving operations was evaluated at several sites in Idaho and Oregon to determine its effectiveness both absolutely and in comparison with crawler tractors in compacting waste and soil cover material, excavating and spreading soil cover, and distributing refuse for compaction. Since the machine is a rubber-tired vehicle that can move over highways under its own power, its use at scattered sites in a sparsely populated area was also evaluated. The advantages and disadvantages that result from the basic concept of a multi-functional machine are presented, the economics of purchase and operation are analyzed, and certain modifications are recommended. (Author)

PB-212 590
Stone (Ralph) and Co., Inc., Los Angeles, Calif.
THE USE OF BAGS FOR SOLID WASTE STORAGE AND COLLECTION.
Final rept.

1972, 297P* EPA-SW-42d-72
Grant G06-EC-00172
Prepared in cooperation with City of Inglewood, Calif.

Descriptors: (*Refuse disposal, *Bags), (*Garbage disposal, Bags), Collection methods, Bag papers, Polyethylene, Time studies, Comparison, Efficiency, Benefit cost analysis, Questionnaires, Public opinion, Earthfills, Field tests, Performance evaluation.
Identifiers: *Solid waste disposal, Paper bags, Plastic bags, Sanitary landfills.

The study was conducted to evaluate the suitability of disposable plastic and paper sack materials for use as solid waste containers. Six residential areas in Inglewood, California, were selected; three were to receive bags for test use and the remainder to serve as a control. Bag systems studied included household polyethylene and paper bags on holders, free-standing paper bags and polyethylene can liners as well as large polyethylene commercial bin liners that were distributed to a number of restaurants. Results were obtained by using time and motion studies and this information was reinforced by laboratory testing and by an aggressive questionnaire program. A model of the collection system was then developed and subsequent simulation studies were employed fo r cost analysis. The project demonstrated that bags are quite satisfactory as solid waste container replacements for cans. The most prominent problems, however, were the difficulties in developing efficient bulk storage and distribution methods of the bags.

PB-212 599
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XVII. A COMPILATION OF TECHNICAL REPORTS (4TH) ON THE BIOLOGICAL EFFECTS AND THE PUBLIC HEALTH ASPECTS OF ATMOSPHERIC POLLUTANTS,
M. Y. Nuttonson. 1972, 153p AICE-AIR-72-17 APTD-1309
Grant EPA-R-800878
See also Volume 16, PB-211 466.

Descriptors: (*Air pollution, *Public health), (*USSR, Air pollution), (*Sulfur dioxide, Air pollution), (*Nitrogen dioxide, Air pollution), (*Alcohols, Air pollution), (*Vanadium oxides, Air pollution), (*Chloroprene, Air pollution), (*Ethylene oxide, Air pollution), (*Styrenes, Air pollution), (*Butadienes, Air pollution), Industrial wastes, Standards, Furfurals, Methyl alcohol, Ethanols, Toxicology, Periodicals, Translations, Permissible dosage.
Identifiers: *Oxetanone/4-methylene-2, *Hexane diamines, *Air pollution effects (Animals).

Contents:
- Maximum permissible concentrations of noxious substances in the air;
- Data for the sanitary validation of maximum permissible concentrations of sulfur dioxide in combination with phenol;
- Data for the mean daily maximum permissible concentration of nitrogen dioxide in atmospheric air;
- Data for a sanitary standardization of low concentrations of a mixture furfural, methanol, and hydrolytic ethanol in the air;
- Threshold concentrations of diketene during short-term inhalation;
- Validation of the mean daily maximum permissible concentration of vanadium pentoxide in atmospheric air;
- The threshold of the reflex effect of chloroprene by the method of electroencephalography;
- Toxicity of microconcentrations of ethylene oxide;
- Standardization of alpha-methylstyrene in the air;
- Maximum permissible concentration of divinyl in atmospheric air;
- New data for the maximum permissible concentration of hexamethylenediamine in populated areas.

PB-212 606
Walden Research Corp., Cambridge, Mass.
AIR POLLUTANT EMISSION INVENTORY FOR THE STATE OF NEW HAMPSHIRE.
Summary rept.,
Paul Morgenstern, Josette C. Goldish, and Ronald G. Orner. Jan 72, 48p APTD-1342
Contract EPA-68-02-0049
Prepared in cooperation with New Hampshire Air Pollution Control Agency, Concord.

Descriptors: (*Air pollution, *New Hampshire), Urban areas, Sources, Inventories, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Natural gas, Solvents, Hydrocarbons, Carbon monoxide, Combustion products, Exhaust gases, Fuels, Transportation, Industrial wastes, Coal, Fuel oil, Evaporation, Waste disposal, Demography, Electric power plants, Waste disposal, Incinerators.
Identifiers: *Air quality data, Implementation Air Pollution Planning Program, Solid waste disposal, Air Quality Control Regions, Open burning, Automobile exhaust.

A summary is presented of the results from an inventory of air pollutant emissions within the State of New Hampshire. The contaminants considered included sulfur oxides, carbon monoxide, nitrogen oxides, hydrocarbons, and particulates. Estimates of the annual emission of the pollutants were developed for the year 1970 and are summarized. The emissions within each of these Regions are summarized by source type. The methodology for preparing the inventory consisted of first determining the consumption of fuels according to combustion sources for power, space heating, and other industrial process needs. The emission of pollutants arising from this set of sources is estimated by the application of appropriate emission factors in conjunction with selected fuel composition. For the case of particulate emissions, the factors also take cognizance of the reduction affected by existing installed control devices. (Author)

PB-212 607
Southern Research Inst., Birmingham, Ala.
A STUDY OF RESISTIVITY AND CONDITIONING OF FLY ASH.
Final rept.

Feb 72, 154p* A-839-2504-13 EPA-R2-72-087
Contract CPA-70-149

Descriptors: (*Air pollution, Fly ash), (*Electrostatic precipitation, *Fly ash), Injection, Conditioning (Treating), Electrical resistance, Sulfur trioxide, Sulfuric acid, Ammonia, Cost estimates, Electric power plants, Flue gases, Particles, Combustion products.
Identifiers: *Air pollution control.

An experimental study was made of the injection of SO3 or H2SO4 gaseous conditioning agent to alleviate the problem of high electrical resistivity of fly ash. This problem interferes with the electrostatic precipitation of fly ash in power stations burning low-sulfur coals and thus providing very low concentrations of H2SO4 as a naturally occurring conditioning agent. Experimental measurements included in the study consisted of determinations of fly-ash resistivity in situ and analyses of coal, flue gases, and fly ash with injected SO3 and H2SO4 concentrations up to 50 ppm. For comparison with conditioning by injected SO3 and H2SO4, a parallel study was made of conditioning by H2SO4 as produced naturally during the burning of coal. To compare the economic aspects of different processes of SO3 and H2SO4 injection, an analysis was made of the various capital and operating costs in existing injection facilities. NH3 was studied as a means of coping with poor precipitator efficiency in a power station burning a high-sulfur coal and thus producing an undesirably high concentration of H2SO4.

PB-212 625
Bendix Aerospace Systems Div., Ann Arbor, Mich.
OFF-LINE ANALYSIS PROGRAMS FOR LONG-PATH SPECTROMETER.
Final rept.,
Roger H. Hansen, and Robert H. Dye. 15 Jun 72, 57p BSR-3322 EPA-R2-72-092
Contract EPA-68-02-0249

Descriptors: (*Infrared spectrophotometers, *Computer programming), (*Ozone, Infrared spectroscopy), Programming manuals, Regression analysis, Factor analysis, Control sequences, Monitors, Spectrochemical analysis, Gas analysis, Air pollution, FORTRAN.
Identifiers: Long path infrared spectroscopy, IBM 360/50 computers, Air pollution detection.

The report documents thirteen off-line analysis programs for the long-path infrared spectrometer instrument and provides user instructions for implementing the programs on an IBM-360/50 computer. Theoretical discussion is included only to the extent necessary to permit the proper use of the programs. (Author)

PB-212 635
International Joint Commission-United States and Canada.
JOINT AIR POLLUTION STUDY OF ST. CLAIR - DETROIT RIVER AREAS FOR INTERNATIONAL JOINT COMMISSION CANADA AND THE UNITED STATES.

Jan 71, 267p APTD-1305

Descriptors: (*Air pollution, *Michigan), (*Canada, Air pollution), Inventories, Sources,

Tables (Data), Sulfur dioxide, Particles, Odors, Demography, Meteorological data, Oxidizers, Trace elements, Metals, Pyrenes, Fluorides, Hydrogen sulfide, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Atmospheric corrosion, Combustion products, Exhaust gases, Industrial wastes, Waste disposal, Atmospheric diffusion, Cost estimates, Transportation, International relations.
Identifiers: *Air quality data, Air pollution effects (Plants), Benzopyrenes, Air pollution effects (Materials), Detroit (Michigan), Port Huron (Michigan), Saint Clair County (Michigan), Macomb County (Michigan), Oakland County (Michigan), Wayne County (Michigan).

As a result of a request, by the City of Windsor, that action be taken to abate the flow of transboundary-pollution emanating from the industrial complex in Wayne County, Michigan, the Governments of Canada and the U.S. initiated an investigation. During this investigation of the air pollution, the following work was undertaken: Air quality measurements were made; Odorous pollutants were investigated; Meteorological measurements were taken; An inventory of atmospheric emissions was made of pollutants emanating from all sources; and A study of the effects of air pollutants in the area on selected vegetation and materials was conducted. The report describes the methods of evaluation and presents the results and conclusions.

PB-212 715
Lockheed Missiles and Space Co., Sunnyvale, Calif. Biotechnology.
STUDY OF FACTORS AFFECTING REACTIONS IN ENVIRONMENTAL CHAMBERS.
Final rept. on Phase 1,
Raphael J. Jaffe. 20 May 72, 113p LMSC-A997745 CRC-APRAC-CAPA-1-69-1
Contract EPA-68-02-0038

Descriptors: (*Photochemical reactions, Test chambers), (*Air pollution, Photochemical reactions), (*Smog, *Test chambers), Design criteria, Simulators, Surface properties, Exhaust gases, Xenon lamps, Cleaning, Gas analysis, Chemical analysis, Nitrogen dioxide, Nitrogen oxide (NO), Ozone, Hydrocarbons, Aldehydes, Photolysis.

The report presents results of factors affecting environmental chambers used to study photochemical reactions in the lower atmosphere. Described are the facilities, the chamber, the light source, and some photochemical reactions. The work has shown the practicality of operating an environmental chamber externally illuminated by a collimated beam of light from an xenon arc lamp. It has also demonstrated that a vacuum chamber pumpdown of the environmental chamber is a feasible method of chamber cleaning. Analytical chemistry methodology has been demonstrated for the photochemical reaction products of interest.

PB-212 727/2
Massachusetts Univ., Amherst. Dept. of Chemistry.
SAMPLING OF GLACIAL SNOW FOR PESTICIDE ANALYSIS,
Water pollution control research series,
T. R. Stengle, J. J. Lichtenberg, and C. S. Houston. Feb 71, 25p W71-10675, EPA-WQO-16020-GAG-02/71
Prepared in cooperation with the Vermont Univ., Burlington. Dept. of Community Medicine.
Paper copy available from GPO $0.35 as EP1. 16026-GAG-0271.

Descriptors: (*Pesticides, *Glaciers), Chlorine aromatic compounds, DDT, Snow, Sampling, Chemical analysis, Contamination, Alloy steels, Boron, Cadmium, Chromium, Iron, Water pollution, Sources.
Identifiers: Biphenyl/chloro.

Snow samples were taken from the plateau glacier of Mt. Logan, Y. T., Canada during an investigation intent on demonstrating the feasibility of taking such samples from high altitude snowfields for pesticide analysis and developing sampling techniques devoid of contamination. Samples were also taken at a depth of 15 m to determine whether DDT concentration varied with the age of the snow. Pesticide analyses were performed using vapor phase chromatographic techniques. DDT was not detected within the limit of detectability (5 ng/l). Over half the samples were contaminated with PCB's which raised the detectability limit to 10-50 ng/l. The PCB contamination is believed to have come from the sampling auger, as an analysis of rinsings from it seemed to confirm. A sample taken from a depth of 1.5-2.5 m was acidified with distilled nitric acid, when thawed, and analyzed for19 elements simultaleously using a direct reading emission spektrometer. Four elements were detected: boron at 4 ng/ml, cadmium at . ng/ml, chromium at 2 ng/ml, and iron at 47 ng/ml. The high levels of cadmium and especially iron suggest contamination from the alloy steels of the auger.

PB-212 729
Battelle Columbus Labs., Ohio.
A STUDY TO IDENTIFY OPPORTUNITIES FOR INCREASED SOLID WASTE UTILIZATION. VOLUME. I.
Final rept.

1972, 178P* EPA-SW-40D.1-72
Grant G06-EC-00282
Prepared in cooperation with National Association of Secondary Material Industries, Inc., New York, N.Y. See also Volume 2, PB-212 730.

Descriptors: (*Waste disposal, *Materials recovery), (*Metal industry, Materials recovery), (*Paper industry, Materials recovery), (*Textile industry, Materials recovery), Utilization, Scrap, Metal scrap, Waste papers, Textiles, Industries, Marketing, Demand (Economics), Supply (Economics), Economic factors, Aluminum, Copper, Lead, Zinc, Nickel, Stainless steel, Precious metals.
Identifiers: *Solid waste disposal, *Waste recycling, *Metal recycling, *Secondary materials industry, Scrap recycling, Junk car disposal.

The study concerns the development of greater solid waste utilization through analysis of the secondary materials industry, its sources of supply, its consuming markets, and its economic and technological problems. Eight separate materials examined are aluminum, copper, lead, zinc, nickel and stainless steel, precious metals, paper, and textiles. Problems inhibiting increased recycling of these materials are identified, and recommended actions are proposed. A survey of the secondary materials industry was the basis for many of the identified problems and also provided numerous statistics on the scrap industry. Volume 1 provides a brief summary of the other 8 volumes, plus an analysis of activities and recycling problems common to all of the commodities. Areas of commonality include such matters as legislation and its effect on recycling, and a description of the equipment used in processing secondary materials.

PB-212 730
Battelle Columbus Labs., Ohio.
A STUDY TO IDENTIFY OPPORTUNITIES FOR INCREASED SOLID WASTE UTILIZATION. VOLUMES II TO VII.
Final rept.

1972, 608P EPA-SW-40D.2-72
Grant G06-EC-00282
Prepared in cooperation with National Association of Secondary Material Industries, Inc., New York, N.Y. See also Volume 1, PB-212 730 and Volumes 8 and 9, PB-212 731.

Descriptors: (*Waste disposal, *Materials recovery), (*Metal industry, Materials recovery), Utilization, Metal scrap, Industries, Marketing, Demand (Economics), Supply (Economics), Economic factors, Aluminum, Copper, Lead, Zinc, Nickel, Stainless steel, Precious metals.
Identifiers: *Solid waste disposal, *Waste recycling, *Metal recycling, *Secondary materials industry, Scrap recycling, Junk car disposal.

The study concerns the development of greater solid waste utilization through analysis of the secondary materials industry, its sources of supply, its consuming markets, and its economic and technological problems. Volumes 2 thru 7 are included. They deal with aluminum, copper, lead, zinc, nickel and stainless steel, and precious metals.

PB-212 731
Battelle Columbus Labs., Ohio.
A STUDY TO IDENTIFY OPPORTUNITIES FOR INCREASED SOLID WASTE UTILIZATION. VOLUMES VIII AND IX.
Final rept.

1972, 342P EPA-SW-40D.3-72
Grant G06-EC-00282
Prepared in cooperation with National Association of Secondary Material Industries, Inc., New York, N.Y. See also Volumes 2 to 7, PB-212 730.

Descriptors: (*Solid waste disposal, *Materials recovery), (*Paper industry, Materials recovery), (*Textile industry, Materials recovery), Utilization, Scrap, Waste papers, Textiles, Industries, Marketing, Demand (Economics), Supply (Economics), Economic factors.
Identifiers: *Solid waste disposal, *Waste recycling, *Secondary materials industry, Scrap recycling.

The study concerns the development of greater solid waste utilization through analysis of the secondary materials industry, its sources of supply, its consuming markets, and its economic and technological problems. The report contains Volumes 8 and 9 which deal with paper and textile recycling.

PB-212 736
American Inst. of Crop Ecology, Silver Spring, Md.
AICE SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XVIII. PURIFICATION OF GASES THROUGH HIGH TEMPERATURE REMOVAL OF SULFUR COMPOUNDS.

1972, 144p AICE-AIR-72-18 APTD-1348
Grant EPA-R-800 878
See also Volume 16, PB-211 466.

Descriptors: (*Air pollution, *Sulfur inorganic compounds), (*Sulfur dioxide, *Chemisorption), (*Hydrogen sulfide, Chemisorption), (*Oxides, *Adsorbents), Adsorption, Flue gases, calcium oxides, Thermodynamics, Iron oxides, Manganese oxides, Electric power plants, Combustion products, Chemical engineering, Heat of activation, Limestone, Translations, USSR, Thermochemistry.
Identifiers: *Air pollution control, Dry methods.

A translation is presented of a Russian monograph which contains the results of the authors' numerous theoretical and experimental studies which deals with the removal of sulfur compounds (hydrogen sulfide and sulfur dioxide) from heated gaseous mixtures through the use of dry methods using metal oxides and without lowering the temperature of the gases. Results of performed thermodynamic and numerous experimental studies are given. Conditions of processes of high-temperature purification of gases by means of solid reagents are indicated. Prospects for the use of dry methods of removal of sulfur compounds from gases at high temperatures under conditions of

combustion of sulfur fuels at steam power plants are evaluated.

PB-212 739/7
Oregon State Univ., Corvallis.
EFFECTS OF AIR POLLUTION ON PUBLIC ATTITUDES AND KNOWLEDGE.
Final rept.,
Robert G. Mason. Jun 72, 151p* EPA-R5-72-007
Contract CPA-70-117

Descriptors: (*Air pollution, *Communications management), (*Public opinion, Air pollution), Attitude surveys, Information, Education, Sociometrics, Mass communication, Management methods, Mathematical models, Visibility, Variability, Government policies, Interviews, Oregon.
Identifiers: *Public information dissemination, Air pollution abatement, Willamette Valley.

The report presents the results of testing a public information model in which attitudes toward and knowledge about air quality play a role. First, the linkage between public attitudes and Government action is discussed. Research efforts tested a hypothesis concerning the relationship between mass media content and attitude change. Second, environmental conditions which may have a bearing on variables in the model are considered. Three variables were considered to be mutually interdependent and were considered endogenous. These were: attitude toward air quality; mass media exposure to information about air quality; and level of air quality knowledge. Variables considered exogenous were: levels of interpersonal discussion; social influence; levels of formal and science education; and use of the environment for recreation purposes. Finally, a theoretical model concerning the acquisition and processing of air quality information, by people, was formulated and tested. (Author)

PB-212 741/3
Environmental Research Corp., St. Paul, Minn.
IN-STACK TRANSMISSOMETER TECHNIQUES FOR MEASURING OPACITIES OF PARTICULATE EMISSIONS FROM STATIONARY SOURCES,
Carl M. Peterson, and M. Tomaides. Apr 72, 87p* EPA-R2-72-099
Contract EPA-68-02-0309

Descriptors: (*Flue gases, Transmissometers), (*Smoke, *Transmissometers), (*Air pollution, Smoke), Field tests, Plumes, Electric power plants, Performance evaluation, Opacity, Transmittance, Detectors, Light scattering, Chimneys, Monitors, Design, Particles.
Identifiers: *Air pollution detection.

Field studies were conducted to obtain basic research data as a base for developing design and performance specifications for transmissometers which are to be used to measure smoke stack plume opacities. Tests, conducted on the stack of a pulverized coal-fired power plant, were designed to evaluate the influence of transmissometer illumination and light receiving angles, and transmitted light wavelength on in-stack opacity measurements and their correlation with the stack plume opacity. Two specially-designed transmissometers, one having a small fixed illumination-viewing angle design and the other having adjustable illumination and viewing angles, were mounted on a cylindrical 145-inch diameter steel stack to measure the in-stack opacity. A 0.5 deg telephotometer was used to determine the out-of-stack opacity of the plume as viewed from a distant river bank. The report contains a description of the transmissometers employed in the study, the experimental test program applied, and the results achieved. (Author)

PB-212 744/7
National Environmental Research Center, Research Triangle Park, N.C.
TOXICOLOGY OF ATMOSPHERIC SULFUR DIOXIDE DECAY PRODUCTS,
Trent R. Lewis, Mary O. Amdur, Martin D. Fritzhand, and Kirby I. Campbell. Jul 72, 47p* AP-111

Descriptors: (*Air pollution, Sulfuric acid), (*Sulfuric acid, *Toxicology), (*Particles, Toxicology), (*Sulfur dioxide, Air pollution), Mist, Aerosols, Lethal dosage, Animals, Humans, Public health, Respiratory diseases, Particle size, Sulfates, CNS disorders, Senses, Physiology, Central nervous system, Dark adaptation, Electrophysiology, Conditioned responses.
Identifiers: *Air pollution effects (Animals), Optical chronaxy.

Studies of atmospheric chemistry have shown that under certain conditions sulfur dioxide can be converted to sulfuric acid and particulate sulfates. Air quality criteria and standards for sulfur dioxide should, therefore, take into account the irritant potency of these oxidation products, recognizing that both sulfur dioxide and its degradation products can react further with other air pollutant constituents. The document reviews toxicity studies conducted in experimental animals, and toxicity studies involving human subjects. The data presented on animal studies examines the effect of sulfuric acid mist particle size and exposure duration on mortality and pathology studies. It also reviews the findings of related studies of pulmonary function. The review presents, from human studies, data which discusses subjective and physiological responses to irritative properties of sulfuric acid mist, and sensory and central nervous system responses to sulfuric acid mist. (Author)

PB-212 782/7
California Univ., Santa Barbara. Dept. of Biological Sciences.
SANTA BARBARA OIL SPILL: SHORT-TERM ANALYSIS OF MACROPLANKTON AND FISH.
Water pollution control research series.

Feb 71, 72p EPA-15080-EAL-02/71
Contract EPA-14-12-534
Paper copy available GPO $0.70 as stock no. 5501-0100.

Descriptors: (*Water pollution, *Marine biology), Oils, California, Pacific Ocean, Ecology, Seasonal variations, Climatology, Fishes, Shrimps, Fisheries, Plankton, Biological surveys.
Identifiers: *Oil pollution, *Water pollution effects (Animals), Oil spills, Santa Barbara (California).

Deep and shallow macroplankton from the Santa Barbara Channel area of the 1969 oil spill and from the Santa Cruz Basin further offshore were compared with others from previous years to study oil damage. Spring and summer collections from nearshore bottom communities of fishes and large invertebrates around kelp beds near the blowout area were compared with collections made prior to the spill and another area. No noticeable fish kills followed the blowout. Most observed changes, apparently unrelated to the spill, corresponded with various climatic anomalies during March through August, 1969. After the blowout, the composition and mode of the Channel Island sport fishery changed with seasonal trends and probably not as a direct effect of the spill. Only the temporary disappearance of tiny mysid shrimps inhabiting the kelp canopy was a likely direct effect.

PB-212 796/7
Southwest Research Inst., San Antonio, Tex.
EVALUATION OF DIESEL SMOKE INSPECTION PROCEDURES AND SMOKEMETERS.
Final rept.,
John O. Storment, and Karl J. Springer. Jul 72, 163p* SwRI-AR-835 APTD-1351
Contract EPA-EHS-70-109

Descriptors: (*Smoke, Detectors), (*Air pollution, Smoke), (*Diesel engines, Smoke), (*Exhaust gases, Diesel engines), Particles, Tests, Opacity, Performance evaluation, Light transmission, Buses (Vehicles), Motor trucks, Calibration.
Identifiers: *Motor vehicle inspection, Smokemeters.

Various vehicle smoke test procedures, smokemeters, and smoke opacity measurement techniques were evaluated by comparison to well known standards. The test procedures were compared to a chassis-dynamometer version of the Federal smoke compliance test. The performance of six commercial smokemeters was compared to that of the standard PHS smokemeter. Also, end-of-line and inline opacity measurements were evaluated by using an inline version of the PHS smokemeter. The smoke test procedures investigated showed varying degrees of correlation with the simulated Federal smoke test, but no one procedure produced data that correlated with the Federal test in every test instance. Other investigations were also conducted: Two enlarged versions of the PHS smokemeter were tested and showed good agreement with the standard unit. Three standard PHS instruments were used in a series of repetitive smoke tests and exhibited excellent agreement.

PB-212 812/2
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
EVALUATION OF MEASUREMENT METHODS AND INSTRUMENTATION FOR ODOROUS COMPOUNDS IN STATIONARY SOURCES. VOLUME I - STATE OF THE ART,
H. J. Hall, and R. H. Salvesen. Jul 72, 98p*
APTD-1180
Contract EPA-68-02-0219

Descriptors: (*Odor detection, Reviews), (*Air pollution, *Odors), (*Gas analysis, Odor detection), Industrial wastes, Sources, Agricultural wastes, Gas detectors, Instruments, Gas chromatography, Colorimetric analysis, Chemiluminescence, Infrared spectroscopy, Bioluminescence, Spectroscopic analysis, Sulfate pulping, Petroleum refining, Paper industry, Aldehydes, Hydrogen sulfide, Thiols, Organic sulfides, Sulfate pulping, Monitors, Amines, Sulfur dioxide.
Identifiers: Coulometric titration, *Air pollution detection, Rendering plants, Manure, Petrochemical industry.

A state-of-the-art review was made to collect and evaluate information on the instrumentation available to measure the quantities of specific odorants in industrial plant emissions. Its object is to examine the possibility of substituting a quantitative measurement of odorants for the subjective measurement of odors as a guide for the control of odorous emissions. The review presents background information for the basic definitions of the problem of odorant emission measurements, and the types of instrumentation available. Details are given of the three industries considered as odorant sources. Information is given on specific instruments which are commercially preferred, or available alternates, or potential alternates where further development is required. (Author)

PB-212 844/5
Purdue Univ., Lafayette, Ind. Combustion Lab.
EMISSIONS FROM AND WITHIN AN ALLISON J-33 COMBUSTOR.
Final rept.,
A. M. Mellor, R. D. Anderson, R. A. Alteskirch, and J. H. Tuttle. Jun 72, 108p CL-72-1 EPA-R2-72-097
Contract EPA-68-04-0001

Descriptors: (*Gas turbine engines, *Exhaust gases), (*Air pollution, Exhaust gases), Static tests, Test facilities, Turbojet engines, Design criteria, Monitors, Gas detectors, Carbon monox-

ide, Nitrogen oxide (NO), Hydrocarbons, Temperature measurement, Air flow.
Identifiers: J-33 engines, Jet engine exhaust.

A gas turbine combustion facility was designed and constructed. After a review and description of the combustion facility, results are presented which include gas temperature, carbon monoxide, and nitric oxide concentration profiles as a function of axial and radial position inside an Allison J-33 combustor. In addition some combustor exit plane measurements are reported. Specifically, the isolated effects of combustor pressure, overall equivalence ratio, and air flow rate on CO and NO concentration at various radial positions are investigated. These results are qualitatively explained in terms of basic combustor processes. Unheated combustor inlet air was used for the above studies; a few preliminary experiments using heated air are also described. (Author)

PB-212 858/5
Esso Research and Engineering Co., Linden, N. J. Government Research Lab.
DEVELOPMENT OF THE AQUEOUS PROCESSES FOR REMOVING NOX FROM FLUE GASES,
Gilford A.Chappell. Sep 72, 212p* EPA-R2-72-051
Contract EPA-68-02-0220

Descriptors: (*Air pollution, Nitrogen oxides), (*Adsorption, *Nitrogen oxides), (*Flue gases, Adsorption), Adsorbents, Water, Hydroxides, Ammonia, Ethanolamine, Acid treatment, Salt water, Adsorptivity, Solutions, Scrubbers, Limestone, Combustion products, Carbonates, Calcium carbonates, Calcium hydroxides.
Identifiers: *Air pollution control, *Alkaline scrubbing, Ammonia scrubbing, Limestone scrubbing.

A screening study was conducted to evaluate the capability of aqueous solutions to scrub NOx from the flue gases emitted by stationary power plants fired with fossil fuels. The report summarizes the findings of this laboratory program. The experimental program studied the following media for absorption of NOx from flue gases containing no NOx: Water; Metal hydroxides and slurries; Ammonia and 2-aminoethanol solutions; Acid solutions; and Salt solutions. In the scrubbing of flue gas containing NO2 and SO2, absorption of NO2-SO2 by sulfites, hydroxides, and carbonates was studied. Combined NOx-SOx scrubbing seems feasible using any of several hydroxide or carbonate systems provided NOx (NO) can be efficiently oxidized to NO2 upstream from the scrubbing unit. (Author)

PB-212 859/3
Air Force Rocket Propulsion Lab., Edwards AFB, Calif.
AN IMPROVED MANUAL METHOD FOR NOX EMISSION MEASUREMENT.
Technical rept.,
L. A. Dee, H. H. Martens, C. I. Merrill, J. T. Nakamura, and J. Martone. Oct 72, 107p*
EPA-R2-72-067

Descriptors: (*Nitrogen oxides, *Gas analysis), (*Air pollution, Nitrogen oxides), Gas sampling, Lead oxides, Chemisorption, Inorganic nitrates, Electrodes, Precipitation (Chemistry), Field tests, Samplers.
Identifiers: *Air pollution detection, Ion selective electrodes.

The current manual NO (x) sampling and analysis method was evaluated. Improved time-integrated sampling and rapid analysis methods were developed. In the new method, the sample gas is drawn through a heated bed of uniquely active, crystalline, PbO2 where NO (x) is quantitatively absorbed. Nitrate ion is later extracted with water and the concentration subsequently determined by a NO3 (-) selective ion electrode. A simple selective precipitation eliminates electrode interferences derived from PbO2 absorption of other combustion products such as HCl, SO (x), HF, and CO. Field tests were conducted at various stationary source sites and the data is presented herein. (Author)

PB-212 968/9
Westinghouse Research Labs., Pittsburgh, Pa.
EVALUATION OF THE FLUIDIZED BED COMBUSTION PROCESS. VOLUME II, TECHNICAL EVALUATION,
D. H. Archer, D. L. Keairns, and J. R. Hamm. Nov 71, 619p* APTD-1166
Contract CPA-70-9
See also Volume 1, PB-211 494.

Descriptors: (*Fluidized bed processors, *Desulfurization), (*Air pollution control equipment, Fluidized bed processors), (*Boilers, Fluidized bed processors), (*Coal, Fluidized bed processors), (*Limestone, *Adsorbents), (*Sulfur dioxide, *Air pollution), (*Fuel oil, Desulfurization), Furnaces, Design, Performance evaluation, Pilot plants, Gasification, Electric power plants, Cost estimates, Capital costs, Industrial engineering, Regeneration (Engineering), Injection, Steam electric power generation, Flue gas, Particles, Gas turbine power generation, Nitrogen oxides.
Identifiers: *Air pollution control, *Limestone injection, Waste gas recovery, Sulfur containing fuels.

The effectiveness and economics of fluidized bed combustion boilers in pollution abatement and steam/power generation have been evaluated. A 250,000 lb/hr coal-fired, factory-fabricated, industrial boiler has been designed along with all of its auxiliaries. Utility boilers have also been designed. Overall capital and operating costs have been estimated for both 300 and 600 megawatt plants. The pressurized fluidized bed combustion boiler operating in a combined cycle power plant appears most effective in meeting projected emission standards and in reducing total SO2, NOx, and particulate emissions, and most economical in power generation. A fluidized bed oil gasification-desulfurization system has also been designed and evaluated as an add-on unit for reducing SO2 emissions from utility boilers burning high-sulfur oils. The estimated capital cost of such a unit is presented.

PB-213 005/3
Iowa State Univ., Ames. Dept. of Botany and Plant Pathology.
THE ECOLOGY OF DIATOMS IN HARD-WATER HABITATS.
Water pollution control research series,
John D. Dodd. Dec 71, 65p W73-01608,
EPA-18050-DIE-12/71
Paper copy available from GPO $0.65 as EPI.16:18050DIE12/71.

Descriptors: (*Diatoms, *Ecology), Taxonomy, Iowa, Water, Hardness, Pollen, Peat, Swamps, Lakes, Rivers, Streams, Ponds, Water pollution, Indicator species, Algae, Paleobotany.
Identifiers: Eutrophication.

Diatoms comprise the major group of algae in Iowa waters. Their ecological significance, important in pollution evaluation studies, cannot be fully appreciated without a thorough knowledge of their taxonomy. A scale for abundance rating was used giving at least a rough estimate if data permitted. The names of 50 diatom genera occurring in Iowa are listed and for each genus, the number of taxa in the master list and the number in the 'more common' list are presented. A pollen analysis is tabulated; the samples in this analysis extended through 35 ft. of sediment to the postglacial interface at Little Miller's Bay, Lake West Okoboji. Dating was conducted by the radiocarbon technique for samples taken between 34 ft. and 35 ft. in the sediment core. Since this level had the maximum spruce pollen concentration and the pollen percentage decreased progressively above this level, it was considered as the postglacial interface. Some interesting problems lie in consideration of those diatoms which have disappeared from the original lake flora and those which have become common only since the middle of the postglacial period.

PB-213 006/0
Syracuse Univ., N.Y. Dept. of Biology.
INORGANIC SULFUR OXIDATION BY IRON-OXIDIZING BACTERIA.
Water pollution control research series,
Donald G. Lundgren. Jun 71, 156p W73-01609,
EPA-14010-DAY-06/71
Paper copy available from GPO $1.25 as EP2.10:14010DAY06/71.

Descriptors: (*Thiobacillus, *Metabolism), (*Mine waters, Thiobacillus), (*Pyrite, *Biodeterioration), Sulfur, Enzymes, Oxidoreductases, Transferases, Iron, Electron microscopy, Oxygen consumption, Inorganic phosphates, Sulfates, Glucose, Water pollution, Iron sulfate, pH.
Identifiers: *Thiobacillus ferrooxidans, *Mine acid drainage, Oxidase/sulfite, Sulfur transferase/thiosulfate, Pyrophosphatases, Dehydrogenase/glucose-6-phosphate, *Water pollution control, Enzyme activity.

Sulfur metabolism of Thiobacillus ferrooxidans and rhodanese-sulfite oxidase enzymes were studied. As disclosed by electron microscope examination, the purified cell envelope of lipopolysaccharide contains a very high quantity of ferric iron. A new colorimetric whole cell assay was developed to study iron oxidation. The presence of pyrophosphatase enzyme was revealed for the first time in chemolithotrophic microorganisms. Study of energy sources disclosed that the chemolithtrophic T. ferrooxidans can evolve heterotrophic mechanisms and grow on glucose, following the Entner-Doudoroff pathway. (Author)

PB-213 008/6
Pacific Environmental Services, Inc., Santa Monica, Calif.
FIELD OPERATIONS AND ENFORCEMENT MANUAL FOR AIR POLLUTION CONTROL. VOLUME I: ORGANIZATION AND BASIC PROCEDURES,
Melvin I. Weisburd. Aug 72, 259p* APTD-1100
Contract CPA-70-122
Prepared in cooperation with System Development Corp., Santa Monica. See also Volume 2, PB-213 009.

Descriptors: (*Law enforcement, *Air pollution), Reviews, Local government, Handbooks, Particles, Sulfur dioxide, Carbon monoxide, Carbon dioxide, Nitrogen oxides, Hydrocarbons, Oxidizers, Meteorological data, Legislation, Plumes, Smoke, Particles, Sampling, Field tests, Sources, Gas detectors, Inspection, Operations, Abatement, Strategies, Regulations.
Identifiers: Government agencies, Air pollution control agencies, *Air pollution detection, Air pollution abatement.

The Field Operations and Enforcement Manual for Air Pollution Control, Volume I, explains in detail the following: sources and classification of pollutants; meteorological influence on air quality; the air pollution control agency; the field enforcement officer; the enforcement process; prosecuting violation; and inspection techniques including plume evaluation, collection of evidence, handling of complaints, and operation of field equipment. Techniques can be applied by state and local air pollution control agencies to meet ambient air quality objectives.

PB-213 009/4
Pacific Environmental Services, Inc., Santa Monica, Calif.

FIELD OPERATIONS AND ENFORCEMENT MANUAL FOR AIR POLLUTION CONTROL. VOLUME II: CONTROL TECHNOLOGY AND GENERAL SOURCE INSPECTION,
Melvin I. Weisburd. Aug 72, 391p APTD-1101
Contract CPA-70-122
Prepared in cooperation with System Development Corp., Santa Monica, Calif. See also Volume 1, PB-213 008 and Volume 3, PB-213 010.

Descriptors: (*Air pollution, *Law enforcement), (*Air pollution control equipment, Reviews), Local government, Handbooks, Regulations, Operations, Particles, Sulfur dioxide, Electric power plants, Inspection, Boilers, Furnaces, Incinerators, Odor detection, Combustion products, Exhaust gases, Smoke, Automobiles, Industrial wastes, Refuse disposal, Abatement.
Identifiers: *Air pollution control, Air pollution control agencies, Open burning, Automobile exhaust, Motor vehicle inspection, Air pollution abatement.

The Field Operations and Enforcement Manual for Air Pollution Control, Volume II explains in detail the following: technology of source control, modification of operations, particulate control equipment, sulfur dioxide removal systems for power plants, and control equipment for gases and vapors; inspection procedures for general sources, fuel burning equipment, incinerators, open burning, odor detection and evaluation, and motor vehicle visible emissions. Much of the information is to aid in educating personnel to understand the processes and equipment involved so that decisions may be made easier.

PB-213 010/2
Pacific Environmental Services, Inc., Santa Monica, Calif.
FIELD OPERATIONS AND ENFORCEMENT MANUAL FOR AIR POLLUTION CONTROL. VOLUME III: INSPECTION PROCEDURES FOR SPECIFIC INDUSTRIES,
Melvin I. Weisburd. Aug 72, 472p APTD-1102
Contract CPA-70-122
Prepared in cooperation with System Development Corp., Santa Monica, Calif. See also Volume 2, PB-213 009.

Descriptors: (*Air pollution, *Law enforcement), Inspection, Abatement, Regulations, Handbooks, Field tests, Operations, Industrial wastes, Paper industry, Iron and steel industry, Petroleum industry, Chemical industry, Metal industry, Foundries, Smelting, Aluminum industry, Mining, Coal preparation, Roofing, Sulfate pulping, Asphalt plants.
Identifiers: *Air pollution control, Air pollution abatement, Rendering plants, Cement industry, Fertilizer industry, Paint industry.

The Field Operations and Enforcement Manual for Air Pollution Control, Volume III explains in detail the following: inspection procedures for specific sources, kraft pulp mills, animal rendering, steel mill furnaces, coking operations, petroleum refineries, chemical plants, non-ferrous smelting and refining, foundries, cement plants, aluminum reduction plants, mining, coal preparation, fertilizer industry, paint and varnish manufacturing, galvanizing operations, roofing plants, and asphalt batch operations. (Author)

PB-213 016/9
A.P.T., Inc., Riverside, Calif.
WET SCRUBBER SYSTEM STUDY. VOLUME I. SCRUBBER HANDBOOK.
Seymour Calvert, Jhuda Goldshmid, David Leith, and Dilip Mehta. Jul 72, 828p* EPA-R2-72-118a
Contract CPA-70-95
See also Volume 2, PB-213 017.

Descriptors: (*Scrubbers, Reviews), (*Air pollution control equipment, Scrubbers), Handbooks, Patents, Mass transfer, Particles, Water impingment, Performance evaluation, Cost analysis, Design criteria, Construction materials, Waste disposal, Column packings, Particle size, Flue gases, Industrial wastes, Drops, Theories, Bubbling, Contacting, Chemical engineering, Mineral industry, Chemical industry, Metal industry, Food processing.
Identifiers: Air pollution control, Solid waste disposal.

The various aspects of scrubber use and present engineering design methods are reviewed. Actual experience on hundreds of scrubber installations in various industries is presented in a condensed form. Many related topics such as auxiliaries, materials of construction, physical and chemical data, cost estimation and optimization techniques, and disposal of liquid and solid wastes are covered. (Author)

PB-213 017/7
A.P.T., Inc., Riverside, Calif.
WET SCRUBBER SYSTEM STUDY. VOLUME II. FINAL REPORT AND BIBLIOGRAPHY,
Seymour Calvert, Jhuda Goldshmid, David Leith, and Dilip Mehta. Jul 72, 181p EPA-R2-72-118b
Contract CPA-70-95
See also Volume 1, PB-213 016.

Descriptors: (*Scrubbers, *Reviews), (*Air pollution control equipment, Scrubbers), (*Bibliographies, Scrubbers), Research management, Project planning, Design criteria, Chemical engineering, Particles, Flue gases, Utilization, Forecasting.
Identifiers: Air pollution control.

The report is part of a review on scrubber technology. The approach and method used to achieve the objectives of the report are described. Two R and D plans are presented; one at a $2 million, five-year level, and the second at a $7 million five-year level. The Bibliography contains about 1,700 references discussing various aspects of wet scrubbers. (Author)

PB-213 019/3
Louisiana State Univ., Baton Rouge. Coates Chemicals Labs.
SPECIFIC METHOD FOR THE DETERMINATION OF OZONE IN THE ATMOSPHERE.
Final rept.,
Sham L. Sachdev, J. P. Lodge, Jr., and Philip W. West. Jan 72, 14p EPA-R3-72-015
Contract CPA-22-69-100

Descriptors: (*Ozone, *Gas analysis), (*Ozonization, *Alkene compounds), (*Air pollution, Ozone), Formaldehyde, Impurities, Phenols, Oxidizers.
Identifiers: *Eugenol, *Air pollution detection.

A description is given of work undertaken to develop a simple, specific, and reliable method for ozone. Reactions of ozone with several 1-alkenes were studied at room temperature (25C). Eugenol (4-allyl-2-methoxy phenol), when reacted with ozone, was found to produce relatively large amounts of formaldehyde as compared to other 1-alkenes tested. The method described was compared with alkaline iodide method for the determination of various concentrations of ozone in the range of 0.05 to 2.0 ppm. The reactions of ozone with eugenol were found to yield stoichiometric amounts of formaldehyde. Hydrogen peroxide, peracetic acid, sulfur dioxide and various reducing agents commonly present in the air, do not interfere with the method. Formaldehyde when present in the air, must be determined simultaneously. Any formaldehyde monitoring equipment can be easily adopted for the determination of ozone. (Author)

PB-213 040/9
Uniroyal, Inc., Wayne, N.J. Research Center.
USE OF LATEX AS A SOIL SEALANT TO CONTROL ACID MINE DRAINAGE.
Water pollution control research series.
Jun 72, 89p EPA-14010-EFK-06/72, W73-01594
Paper copy available from GPO $1.00 as EP1.16:14010EFK06/72.

Descriptors: (*Water pollution, Mine waters), (*Mines, Sealing), Latex, Feasibility, Particle size, Field tests, Permeability, Soil properties, Biodeterioration, Styrene butadiene resins, Coal mines, Waterproofing, Cost estimates.
Identifiers: *Soil sealants, Water pollution abatement, *Mine acid drainage, Surface sealing.

Acid formation in a mine cavity can be prevented by keeping water (one of the reactants) out of the mine. This might be accomplished by forming a waterproof seal over the mine cavity to prevent the seepage of surface water into the mine. In laboratory tests using reconstructed soil columns, rubber latex showed good sealing efficiency. The ideal situation in which latex would coagulate in a narrow zone two to three feet below the surface by reacting with acidic or metallic constituents of the soil was not attained. Rather, in field tests the latex was deposited progressively. Latex stability appears to be a more critical property than latex particle size in controlling penetration. Addition of excess anionic surfactants to latex improved its penetration into the soil. Costs are discussed.

PB-213 041/7
Water Pollution Control Federation, Washington, D.C.
RESEARCH SUPPLEMENT TO JOURNAL - WATER POLLUTION CONTROL FEDERATION.
Water pollution control research series.

Jun 71, 33p W73-01635, EPA-16090-DQZ-06/71
Paper copy available from GPO $0.45 as EP1.16:16090DQZ06/71.

Descriptors: (*Water pollution, *Periodicals), Failure, Publicity, Acceptability, Attitude surveys, Questionnaires, Research, Project planning, Cost analysis, Publishing.

Discussed is the publication of a quarterly research supplement to Journal Water Pollution Control Federation with federal grant support. This was carried out from October 1967 to August 1970 and was an experimental effort to determine the feasibility of such a publication in developing its own self-sustaining support as an effective and economical means of disseminating research information to the water pollution control field. The 12 issues published in the three-year grant period proved to be an effective means of such dissemination and demonstrated an excellent method of creating a permanent, retrievable source of pertinent information. The project was not successful economically in that advertising and other revenues did not reach anticipated goals. The project was terminated in August 1970 at the end of the grant period. (Author)

PB-213 042/5
Environmental Research and Application, Inc., Wilton, Conn.
CONCENTRATED MINE DRAINAGE DISPOSAL INTO SEWAGE TREATMENT SYSTEMS.
Sep 71, 81p W73-01639, EPA-14010-FBZ-09/71
Paper copy available from GPO $0.75 as stock no. EP1 16:14010-FBZ-09/71.

Descriptors: (*Sewage treatment, *Brines), (*Mine waters, Sewage treatment), Waste disposal, Iron, Osmosis, Inorganic phosphates, Activated sludge process, Sludge digestion, Precipitation (Chemistry), Design, Cost estimates, Biochemical oxygen demand.
Identifiers: *Mine acid drainage, Liquid waste disposal, Nitrification, Denitrification, Chemical oxygen demand.

Studies were undertaken on a small scale to determine the effect liquid waste artificial iron-rich acid brines had on municipal sewage treatment

processes. The brines were devised to simulate concentrates from treatment of acid mine drainage. At very high concentrations, the brines neutralized with lime give virtually complete removal of phosphate from primary effluent, activated sludge effluent, or anaerobic sludge digester decantate. The cost of the iron-rich acid brine produced from acid mine drainage by the reverse osmosis membrane treatment is estimated. Costs of transportation by rail, truck, and pipeline are also shown. (Author)

PB-213 043/3
Florida Univ., Gainesville. Dept. of Coastal and Oceanographic Engineering.
DEPOSITION OF FINE SEDIMENTS IN TURBULENT FLOWS.
Emmanuel Partheniades, and Ashish J. Mehta.
Aug 71, 44p W73-01567, EPA-16050-ERS-08/71
Paper copy available from GPO $0.50 as stock no. EP1.16:16050 ERS 08/71.

Descriptors: (*Sediments, Deposition), (*Sediment transport, Turbulent flow), Suspended sediments, Shear stress, Clays, Silts, Sedimentalogy, Drag, Open channel flow.

Deposition of fine cohesive sediments in a turbulent flow field was studied in a system of a rotating annular channel and ring. The percentage of the total sediment that a given flow can maintain in suspension depends only on the bed shear stress and is independent of the initial sediment concentration. The percentage (C) of the depositable sediment deposited at time t has been found to vary with time according to the law C±a log t + b, where the coefficient a is independent of the flow conditions and sediment concentration, while the coefficient b is a function of the bed shear stress only. Both a and b depend on the physicochemical properties of the sediment and the water environment. Deposition rates are proportional to the depositable sediment concentration and inversely proportional to time. (Author)

PB-213 071/4
Environmental Protection Agency, College, Alaska. Alaska Water Lab.
WINTER SURVIVAL OF FECAL INDICATOR BACTERIA IN A SUBARCTIC ALASKAN RIVER,
R. C. Gordon. Aug 72, 46p W73-01507, EPA-R2-72-013
Paper copy available from GPO $0.50 as EP1.23/2: 72-013.

Descriptors: (*Water pollution, Coliform bacteria), (*Coliform bacteria, Cold tolerance), (*Feces, Water pollution), Water quality, Indicator species, Enterobacteriaceae, Organic waste, Water chemistry, Arctic regions, Hydrology, Alaska, Rivers.

Survival of fecal indicator bacteria in a subarctic Alaskan river was studied during the winter of 1969-70 when there was total ice cover and the water temperature was 0 deg C. Most of the domestic pollution entered the river from one source. Since no additional pollution entered downstream from this source, an uninterrupted study covering 7 days of flow (210 river miles) was possible. Nine sample stations were established to obtain total coliform, fecal coliform, enterococcus and water chemistry data. Samples were collected four to eight times from each station during the 2-week period of data collection, and a discharge measurement was made at each station during the same period. Bacteria survival was examined with and without consideration for the effect of dilution. After 7 days flow time, total coliforms were reduced to 3.2-6.5 percent of the initial count, fecal coliforms to 2.1-4.2 percent, and the enterococci to 18.1-37.3 percent depending on dilution consideration.

PB-213 072/2
California Univ., Berkeley.
FLOW INTO A STRATIFIED RESERVOIR,
William M. Thurston. Aug 72, 67p* W73-01570, EPA-R2-72-037
Paper copy available from GPO $0.65 as EP1.23/2: 72-037.

Descriptors: (*Reservoirs, Currents), (*Environmental engineering, Reservoirs), Hydraulic jump, Water intakes, Water pollution, Water quality, Hydrodynamic models, Dynamic tests, Flow visualization, Flow measurement, Mathematical prediction.
Identifiers: Stratified flow, Stratified reservoirs.

The flow caused by a line source discharging into a stagnant, linearly density stratified reservoir was studied in a tank. The flow enters the reservoir as a horizontal line jet but immediately passes through an internal hydraulic jump and forms a slowly moving wedge of fluid mixed into the injection by the jump. The inflow also induces a series of layers of flow in alternating directions above and below the entering layer. The mixed layer was made visible by mixing blue dye into the supply fluid. The length, thickness, and tip speed of the mixed layer were measured as a function of time, and an empirical scaling relationship was derived. The results may be used to predict the extent of mixed layers which might occur during the pumping phase in a jump-storage reservoir.

PB-213 073/0
Pacific Northwest Water Lab., Corvallis, Oreg.
FOREST FERTILIZATION (A STATE-OF-THE-ART REVIEW AND DESCRIPTION OF ENVIRONMENTAL EFFECTS),
William A. Groman. Aug 72, 62p* W73-01638, EPA-R2-72-016
Paper copy available from GPO $0.65 as EP1.23/2: 72-016.

Descriptors: (*Forestry, *Fertilization), (*Water pollution, *Fertilizers), Reviews, Water quality, Forest land, Trends, Socioeconomic status, Trees (Plants), Nutrients, Hydrology, Nitrogen, Surface water runoff, Limnology, Europe, United States.
Identifiers: *Water pollution effects (Plants), Forest management.

The application of chemical fertilizers to forest soils for site amelioration is one of the newest and most promising methods for increasing production. Concern has risen over possible toxic and eutrophic effects of fertilization on water quality. Data was assembled on the scope and trends of the practice throughout the world in order to determine the extent of actual or potential detrimental effects of forest fertilization, and to evaluate priority for grants. Results of completed forest fertilization-water quality studies are summarized and evaluated, and the status of current water quality studies in described. Recommendations are given for reviews and new research efforts. (Author)

PB-213 118/3
Envirogenics Co., El Monte, Calif.
IN-SEWER FIXED SCREENING OF COMBINED SEWER OVERFLOWS.
Oct 70, 150p W73-01774, EPA-11024-FKJ-10/70
Contract EPA-14-12-180
Paper copy available from GPO $1.25 as stock no. EP1.16:11024-FKJ-10/70.

Descriptors: (*Combined sewers, *Sewage filtration), Particle size, Surface water runoff, Overflows, Chlorination, Performance evaluation, Size screening, Biochemical oxygen demand, Oils, Rainfall intensity, Correlation, Greases, Bacteria, Design, Engineering drawings.
Identifiers: Storm water runoff.

Field sampling and measuring were conducted in conjunction with laboratory investigations on the characterization of combined sewage and the effects of solids removal on chlorination practices. Sixty combined sewage bulk samples and 60 combined sewage screenings samples retained on screens of 0.125-, 0.25-, 0.5-, and 1.0 in. aperture were analyzed and evaluated. Removals of deoxygenating materials, oils and greases, and bacteria by fixed screens placed in combined sewers were marginal. Reductions in chlorine requirements as a result of prior solids removal by fixed screening appear small. Screens with aperture sizes ranging from 0.0164 to 1.0 in. appear to have very little effect on bacterial concentrations. (Author)

PB-213 119/1
Hittman Associates, Inc., Columbia, Md.
GUIDELINES FOR EROSION AND SEDIMENT CONTROL PLANNING AND IMPLEMENTATION,
Burton C. Becker, and Thomas R. Mills. Aug 72, 243p W73-01773, EPA-15030-FMZ/2
Paper copy available from GPO $1.75 as stock no. EP1.23/2:72-015. Also available as Rept. no. EPA-R2-72-72-015.

Descriptors: (*Erosion control, Instructions), (*Construction, Residential buildings), (*Urban development, *Maryland), Urbanization, Land development, Hydrology, Soil stabilization, Building codes, Roads, Soil conservation, Drainage, Streams, Urban areas, Soil erosion, Sediment transport.
Identifiers: *Erosion planning.

The principal purpose of the guidelines is to help those engaged in urban construction to prevent the uncontrolled movement of soil and the subsequent damage it causes. A comprehensive approach to the problem of erosion and sediment control provides: A description of how a preliminary site evaluation determines what potential sediment and erosion control problems exist at a site being considered for development, Guidance for the planning of an effective sediment and erosion control plan, and Procedures for the implementation of that plan during operations. Technical information on 42 sediment and erosion control products, practices, and techniques is contained in four appendices. (Author)

PB-213 120/9
Georgia Univ., Athens. Dept. of Microbiology.
ENTERIC BACTERIAL DEGRADATION OF STREAM DETRITUS,
Charles W. Hendricks. Dec 71, 110p W73-01783, EPA-16050-EQS-12/71
Paper copy available from GPO $1.00 as stock no. EP1-16:16050-EQS-12/71.

Descriptors: (*Water pollution, *Bacteria), (*Water quality, Bacteria), (*Aquatic microbiology, *Enterobacteriaceal), Nutrients, Sediments, Derritus, Salmonella, Shigella, Adsorption, Cultures (Biology), Public health, Georgia, Metabolism.
Identifiers: Water pollution effects (Plants), Pathogenic bacteria, Oconee River.

To relate basal nutrients in the water and on the bottom of a warm, fresh water stream to their ability to support growth and multiplication of pathogenic and nonpathogenic enteric bacteria, three studies were designed including a river water quality analysis, respiration experiments, and continous culture experiments. The presence of coliform bacteria primarily not producing intestinal disease, serves as indicators for potentially infectious microorganisms. Any growth by either coliform bacterial group or the disease producing organisms in the natural aquatic environment could significantly alter our present concepts of detection and surveillance of these organisms. Tests in detecting and analyzing polluted waters, and from levels of the self-purification potential, showed that Oconee River, a typically non-polluted stream of the North Georgia piedmont, is capable of supporting bacterial growth including coliforms. (Author)

PB-213 121/7
Applied Science Labs., Inc., State College, Pa.
PURIFICATION OF MINE WATER BY FREEZING.
Water pollution control research series.

Feb 71, 65p W73-01817, EPA-14010-DRZ-02/71
Paper copy available from GPO $0.70 as EP1.16:14010DRZ02/71.

Descriptors: (*Mine waters, *Freezing), (*Water pollution, Mine waters), Metals, Acids, Iron inorganic compounds, pH, Coal mines, Calcium oxides, Sulfates, Purification.
Identifiers: *Water pollution control, *Mine acid drainage.

Partial freezing of acid mine water was used to the extent of 50% conversion to ice. Various metal and acid components in the product water were consistently reduced 85 to 90%. Acid mine water that had been treated with lime was used in similar freezing experiments and observed to have a reduction of metal ions. The pH remained substantially unchanged and the hardness of the water was reduced by nearly 100%. Considerable variations resulted even with efforts toward good control and reproducibility of operation. A firm conclusion as to reduction of sulfate and reduction of certain individual metals was prevented because of difficulties with analytical results. (Author)

PB-213 122/5
Milwaukee Sewerage Commission, Wis.
EVALUATION OF CONDITIONING AND DEWATERING SEWAGE SLUDGE BY FREEZING.
Water pollution control research series.

Jan 71, 66p W73-01858, EPA-11010-EVE-01/71
Grant WPRD-71-01-68
Paper copy available from GPO $0.70 as EP1.16:11010EVE01/71.

Descriptors: (*Sludge drying, *Freezing), (*Sewage treatment, Sludge drying), Dewatering, Activated sludge process, Sludge disposal, Cost estimates, Operating costs, Capital costs, Flotation, Wisconsin.
Identifiers: Milwaukee (Wisconsin).

Data was obtained for a direct comparison between the freeze conditioning and dewatering technique and the conditioning and dewatering methods presently employed at Milwaukee, Wisconsin. The laboratory investigation phase resulted in a freeze-conditioning system consisting of the following process elements: Flotation thickening prior to freezing, Freezing in thin sheets, Thawing of the frozen product, and Dewatering of the thawed sludge. The objective of the engineering design phase was the development of a freeze-conditioning system to handle three tons dry solids per day of activated sludge. Although the freeze conditioning concept, from a technical standpoint, has definite merit as a sludge conditioning process, the equipment capital costs, operating costs, and space requirements are appreciably greater for the freeze conditioning process than for the present chemical conditioning method. (Author)

PB-213 132/4
ESCO/GREENLEAF, Los Angeles, Calif.
SOLID WASTE HANDLING AND DISPOSAL IN MULTISTORY BUILDINGS AND HOSPITALS. VOLUME I. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.
Final rept.

1972, 244P* EPA-SW-34D.1-72
Grant G06-EC-00164
See also Volume 2, PB-213 133.
Also available from GPO $2.00 as stock no. 5502-0082.

Descriptors: (*Refuse disposal, *Buildings), (*Hospitals, Refuse disposal), Apartment buildings, Office buildings, Collecting methods, Materials handling equipment, Design criteria, Cost estimates, Incinerators, Earth fills, Manpower, Reclamation, Materials recovery, Chutes.
Identifiers: *Solid waste disposal, Jails.

A study of solid waste handling, storage, processing, and disposal systems and practices in multistory buildings, hospitals, and detention facilities is reported in four volumes. The first volume presents a digest of study objectives, development of systems evaluation methodology, and criteria for systems design, together with a brief review of the total study. (Author)

PB-213 133/2
ESCO/GREENLEAF, Los Angeles, Calif.
SOLID WASTE HANDLING AND DISPOSAL IN MULTISTORY BUILDINGS AND HOSPITALS. VOLUME II. OBSERVATIONS OF LOCAL PRACTICE.
Final rept.

1972, 301P EPA-SW-34D.2-72
Grant G06-EC-00164
See also Volume 1, PB-213 132 and Volume 3, PB-213 134.

Descriptors: (*Refuse disposal, *Buildings), (*Hospitals, Refuse disposal), Office buildings, Collecting methods, Materials handling equipment, California, Cost estimates, Operating costs, Reclamation, Materials recovery, Manpower, Chutes.
Identifiers: Jails, *Solid waste disposal.

A study is presented of solid waste handling, storage, processing, and disposal systems and practices in multistory buildings, hospitals, and detention facilities. The complete study is reported in four volumes. Volume II is a detailed study and evaluation of systems and practices in fifteen County-owned building complexes, including seven hospitals, four multistory office buildings, and four detention facilities, varying in function and size within each classification. The report establishes the theoretical standards of operation peculiar to each plant and, through field observations, actual operating conditions of these systems. (Author)

PB-213 134/0
ESCO/GREENLEAF, Los Angeles, Calif.
SOLID WASTE HANDLING AND DISPOSAL IN MULTISTORY BUILDINGS AND HOSPITALS. VOLUME III. RESEARCH ON SYSTEMS DEVELOPMENT.
Final rept.

1972, 224P EPA-SW-34D.3-72
Grant G06-EC-00164
See also Volume 2, PB-213 133, and Volume 4, PB-213 135. Also available from GPO $1.75 as stock no. 5502-0083.

Descriptors: (*Refuse disposal, *Buildings), (*Hospitals, Refuse disposal), (*Materials handling equipment, Refuse disposal), Apartment buildings, Office buildings, Storage, Collecting methods, Chutes, Conveyors, Containers, Comminution, Grinding mills, Pneumatic conveyors.
Identifiers: *Solid waste disposal, Solid waste storage, Jails.

A study is presented of solid waste handling, storage, processing, and disposal systems and practices in multistory buildings, hospitals, and detention facilities. The complete study is reported in four volumes. This volume covers an investigation and evaluation of available solid waste handling, storage, processing, and disposal equipment and systems adaptable to building installations. The report provides coverage on both marketed systems and equipment components, as well as systems concepts in the development and idea stage. (Author)

PB-213 135/8
ESCO/GREENLEAF, Los Angeles, Calif.
SOLID WASTE HANDLING AND DISPOSAL IN MULTISTORY BUILDINGS AND HOSPITALS. VOLUME IV. SELECTION AND DESIGN OF SOLID WASTE SYSTEMS.
Final rept.

1972, 189P EPA-SW-34D.4-72
Grant G06-EC-00164
See also Volume 3, PB-213 134.

Descriptors: (*Refuse disposal, *Buildings), (*Hospitals, Refuse disposal), Office buildings, Apartment buildings, Collecting methods, Materials handling equipment, Performance evaluation, Optimization, Design criteria, Operating costs, Materials recovery, Reclamation, Waste treatment, Regulations, Incinerators, Cost estimates, Manpower.
Identifiers: *Solid waste disposal, Jails, Solid waste storage.

The report concerns a study of solid waste handling, storage, processing, and disposal systems and practices in multistory buildings, hospitals, and detention facilities. The complete study is reported in four volumes. This volume provides an extended evaluation of systems adaptable to the various classifications of buildings and complexes considered in the study, with recommendations for operational improvements or modifications of existing systems as may be required in each type of facility. Design criteria and preliminary design of systems modifications, together with outline specifications and cost estimates covering installation and operation, are developed on a selected building complex. (Author)

PB-213 152/2
Westinghouse Research Labs., Pittsburgh, Pa.
EVALUATION OF THE FLUIDIZED BED COMBUSTION PROCESS. VOLUME III. APPENDICES,
D. H. Archer, D. L. Keairns, and J. R. Hamm. 15 Nov 71, 1013p* APTD-1167
Contract CPA-70-9
See also Volume 2, PB-212 960.

Descriptors: (*Electric power plants, Air pollution control equipment), (*Boilers, Fluidized bed processors), (*Fluidized bed processors, *Desulfurization), (*Air pollution control equipment, Fluidized bed processors), (*Coal, Fluidized bed processors), (*Fuel oil, Desulfurization), (*Air pollution, *Combustion products), Electric utilities, Market research, Design, Heat recovery, Cost estimates, Dolomite (Rock), Industrial engineering, Chemical engineering, Flue gases, Regeneration (Engineering), Furnaces, Gasification, Engineering drawings, Gas burners, Cooling systems.
Identifiers: *Air pollution control, *Waste gas recovery, *Lime stone injection, Sulfur containing fuels, Gas turbine combustors.

The results of the evaluation of fluidized bed combustion for steam/power generation are presented in the three-volume report. The research concerns two fluidized bed fuel processing systems which should meet both market requirements and air pollution abatement requirements and are likely to be cheaper than alternative, conventional systems. Volume III contains the following detailed backup reports: Electric utility and Industrial boiler market survey; Development of fluidized bed combustion boilers; Industrial boiler design report; Turndown techniques for atmospheric fluidized bed boilers; Dynamics of atmospheric fluidized bed boilers; Optimization of heat trap system cost; Pressurized boiler design report; Regeneration/sulfur recovery system cost; Pressurized boiler combined cycle plant report; Atmospheric-pressure boiler design report; Boiler burner for low Btu gas; Gas turbine corrosion, erosion, and fouling; and Stack gas cooler design.

PB-213 193/6
Rhode Island Univ., Kingston. Graduate School of Oceanography.
CHEMICAL RESPONSES BY MARINE ORGANISMS TO STRESS. STRESS IN HARD CLAMS FROM A POLLUTED ESTUARY,
H. Perry Jeffries. Dec 71, 30p W73-01975, EPA-R3-72-017

Descriptors: (*Aquatic animals, Water pollution), (*Clams, Water pollution), Petroleum products, Organic wastes, Estuaries, Water chemistry, Amino acids, Taurine, Carbohydrates, Glycine, Hydrocarbons, Ecology, Mortality, Shellfish, Biochemistry.
Identifiers: Mercenaria mercenaria, Water pollution effects (Animals), Oil pollution.

The hard clam, Mercenaria mercenaria, shows a general response to environmental variation. The molar ratio of free taurine to glycine in gill and mantle tissues climbs above 3, while alpha-amino acids and carbohydrates decrease. Subtle adjustments in the total pattern of free amino acids and fatty acids also occur, but these can be readily seen by changes in biochemical diversity and equitability. In an estuary long suffering from hydrocarbons and other agents in petroleum products and sewage, high mortality results from a culmination of natural responses superimposed on abnormal complications. The process apparently starts after a black, polymeric irritant collects in epithelial tissue and eventually occludes the renal sac. This leads, indirectly, to infestations of a parasitic polychaete that is rarely found in hard clams. A syndrome with many facets soon becomes clear, but the situation can be identified and its results predicted by simply observing the responses of taurine and glycine in stressed and normal populations.

PB-213 210/8
Battelle Columbus Labs., Ohio.
WATER QUALITY CRITERIA DATA BOOK. VOLUME 3: EFFECTS OF CHEMICALS ON AQUATIC LIFE. SELECTED DATA FROM THE LITERATURE THROUGH 1968.

May 71, 541p* W73-01976, EPA-18050-GWV-05/71
Contract EPA-68-01-0007
See also PB-208 988 and PB-208 987.
Paper copy available from GPO $3.75 as stock no. EP1.16:8050-GWV-05/71.V.3.

Descriptors: (*Water pollution, *Toxicology), (*Aquatic biology, Water pollution), Inorganic compounds, Organic compounds, Tables (Data), Bioassay, Fish, Biochemical oxygen demand, Industrial wastes, Indicator species, Temperature, Sources, Dissolved gases, Oxygen, Metals, Organic wastes, Pesticides, Chlorine organic compounds, Phenols, Cyanides.
Identifiers: *Water pollution effects (Animals), *Water pollution effects (Plants).

Original data from more than 500 technical publications concerning the specific effects of chemicals on individuals species of aquatic biota were collected and summarized in a uniform format. Alphabetical assembly of the data by chemical allows rapid access to considerable detailed information. A species index facilitates search for information on the toxicity of chemicals to individual aquatic species. The details of major procedures in laboratory bioassay and field assessment of chemical toxicity in water are discussed. Freshwater and marine procedures are included. A total of 961 references were used. (Author)

PB-213 257/9
TRW Systems Group, Redondo Beach, Calif.
DEVELOP HIGH CHARGE AND DISCHARGE RATE LEAD/ACID BATTERY TECHNOLOGY.
Final rept. 28 Apr 71-18 Mar 72,
H. P. Silverman. Apr 72, 170p 18353-6006-RO000 APTD-1345
Contract EPA-68-04-0028

Descriptors: (*Lead acid batteries, Design), (*Motor vehicles, Lead acid batteries), (*Automobiles, Lead acid batteries), Electric motors, Electric discharges, Performance evaluation, Fabrication, Battery electrodes, Air pollution, Abatement, Specifications.
Identifiers: *Air pollution abatement, *Hybrid vehicular propulsion, Electromechanical transmissions.

The objective of this program was to develop a high charge rate, high discharge rate lead-acid battery compatible with the requirements of a hybrid heat-engine/electric vehicle. Because the power requirements and charge-discharge profiles for a hybrid-vehicle battery are sufficiently different than those for a conventional lead-acid battery, a development program was undertaken to optimize the lead-acid battery for hybrid-vehicle use. As a result of this program, ten test cells producing specific powers of 150 W/lb for a 75-sec discharge and 204 W/lb for a 20-sec discharge were developed and tested. The achievements under this program included: fabrication of thin, conductive vitreous carbon-epoxy substrates, chemically inert to lead-acid cell environment; a method for applying (pasting) the active material onto the substrate; negative bipolar plates that exceeded the performance target of 2A/sq in (0.3 A/sq cm) at 1.5V for 60 sec. and out performed standard pasted plates. (Author)

PB-213 263/7
TRW Systems Group, Redondo Beach, Calif.
PORTABLE LASER VELOCIMETER FOR STACK VELOCITY MEASUREMENTS.
Final rept.,
L. O. Heflinger, B. J. Matthews, and H. Shelton.
Nov 72, 68p* 20852-6002-RO00 EPA-R2-72-132
Contract EPA-68-02-0308

Descriptors: (*Flowmeters, *Flue gases), (*Lasers, Flowmeters), (*Air pollution, *Speed indicators), Design, Backscattering, Spectrum analysis, Portable equipment, Doppler shift, Reticles, Fabrication, Specifications, Tests, Remote sensing.
Identifiers: *Laser velocimeters, Air pollution detection.

The report describes the design and development of a short range, laser velocimeter together with the analysis of optical velocity measurement techniques over ranges up to 1500 ft. This laser velocimeter operates on an interference-backscatter principle. It is portable and designed to measure velocities of flowing particle laden gases in power plant ducts or stacks at relatively close ranges. The instrument is composed of a sensing head cabinet and an electronics cabinet. The sensing head incorporates a laser illuminator, beam forming optics and photodetector. The electronics cabinet contains a signal processing circuit, spectrum analyzer, and power supplies for the laser and spectrum analyzer. The design, construction and preliminary testing of the velocimeter are discussed. Also presented is an analysis of optical velocity measuring devices for extended range operation. Three types of optical velocimeters were considered: Doppler shift, interference-fringe; and a reticle velocimeter. (Author)

PB-213 280/1
TRW Systems Group, Redondo Beach, Calif.
COST AND EMISSION STUDIES OF A HEAT ENGINE/BATTERY HYBRID FAMILY CAR.

Apr 72, 267p* 21054-6001-RO00 APTD-1355
Contract EPA-68-04-0058

Descriptors: (*Air pollution, Exhaust gases), (*Motor vehicles, *Exhaust gases), (*Automotive transmissions, Design), (*Air pollution control equipment, Automobile engines), Motor vehicle drive systems, Internal combustion engines, Electric batteries, Electric vehicles, Performance evaluation, Cost estimates, Absorbers (Equipment), Catalysis, Hydrocarbons, Desorption, Traps, AC generators, Tests, Weight (Mass).
Identifiers: *Hybrid vehicular propulsion, Automobile exhaust, Electromechanical transmissions, Hydrocarbon accumulators, *Catalytic reactors (Exhaust systems), *Air pollution control, Air pollution abatement.

An experimental and analytical study was conducted. The broad objectives of the studies were as follows: to select and analyze the performance of series and parallel configured heat engine/battery hybrid family cars; to define the relative efficiencies, weight and costs of hybrid power trains; to generate data characteristics of selected three-component catalysts; to perform preliminary materials screening and development of a hydrocarbon emission trap (hydrocarbon accumulator); and to demonstrate that a hybrid car with an internal combustion engine could meet the 1975/76 emission goals. The document describes the work done and presents the results and conclusions. (Author)

PB-213 294/2
Walden Research Corp., Cambridge, Mass.
BACKGROUND INFORMATION FOR ESTABLISHMENT OF NATIONAL STANDARDS OF PERFORMANCE FOR NEW SOURCES. CASTOR BEAN PROCESSING.

Jul 72, 36p* APTD-1361
Contract CPA-70-165

Descriptors: (*Castor oil, *Refining), (*Air pollution, *Vegetable oils), (*Industrial wastes, Castor oil), Seeds, Beans, Processing, Production engineering, Economic analysis, Particles, Air pollution control equipment, Scrubbers, Incinerators, Aliphatic acid esters, Dust collectors, Demand (Economics).
Identifiers: Castor bean processing, Castor pomace.

Castor oil is one of the more important vegetable oils being used industrially. The report presents background information for this new source of pollutant emission. The following topics are discussed: The economic and statistical background which includes castor oil production facilities; Production methods and processes which include seed handling, castor pomace processing, and oil refining; The uses of castor oil and castor oil products; Industrial emissions which primarily include particulates and emissions from oil refining; and Control technology involving dry particulate collectors, wet scrubbers, adsorption, and incineration. (Author)

PB-213 297/5
Catalytic, Inc., Charlotte, N.C.
STATE OF THE ART FOR CONTROLLING NOX EMISSIONS, PART I. UTILITY BOILERS,
L. K. Jain, E. L. Calvin, and R. L. Looper. Sep 72, 118p* EPA-R2-72-072a
Contract EPA-68-02-0241

Descriptors: (*Boilers, *Combustion products), (*Air pollution, *Nitrogen oxides), (*Combustion control, Boilers), Reviews, Furnaces, Design criteria, Flue gases, Process variables, Temperature control, Mixing, Combustion efficiency, Combustion chambers, Electric power plants, Cost estimates, Gas burners, Oil burners, Coal.
Identifiers: *Air pollution control.

A report is presented with the objective of identifying the 'State of the Art' of NOx emission reduction from stationary sources through combustion modification. This first part of a two part report deals with the control of NOx from utility boilers. The report presents information on sources of, and formation of nitrogen oxides. A total of five factors which effect utility boiler emissions are discussed in detail. A discussion of 'Combustion Modification for NOx Emission Control', includes the following topics: combustion operating modification, combustion equipment, design modifications, and flue gas treatment. (Author)

PB-213 299/1
Environmental Protection Agency, Athens, Ga. Southeast Water Lab.
INDUSTRIAL WASTE SURVEY, DADE COUNTY, FLORIDA.
Technical rept.

Sep 71, 108p TS03-71-208-03.1
Prepared in cooperation with Lower Florida Estuary Study, Ft. Lauderdale, Florida.

Descriptors: (*Water pollution, *Florida), Inventories, Industrial wastes, Biochemical oxygen demand, Oils, Water quality, Phenols, Suspended sediments.
Identifiers: *Dade County (Florida), Chemical oxygen demand.

The report presents an inventory of water pollution in Dade County, Florida. The sources, types, and concentration of pollutants are presented.

PB-213 300/7
Environmental Protection Agency, Athens, Ga. Southeast Water Lab.
CONTAINER CORPORATION OF AMERICA, BREWTON PLANT, CONECUH-ESCAMBIA RIVER BASIN STUDY.

Feb 71, 26p
See also PB-213 301.

Descriptors: (*Water pollution, *Spent liquors (Pulping)), (*Escambia River, Water pollution), (*Alabama, Water pollution), Florida, Conecuh River, Industrial wastes, Industrial waste treatment, Water quality, Paper industry.
Identifiers: Brewton (Alabama), Escambia County (Alabama), Santa Rosa County (Florida), Escambia County (Florida).

Container Corporation of America's (CCA) integrated pulp and paper mill at Brewton, Alabama is in the process of increasing pulping capacity from 900 tons per day to 1050 tons per day. Its waste effluent flows into the Conecuh River and then into the Escambia River. Preceding this expansion is the installation of additional secondary waste treatment facilities. During August 17-28, 1970, prior to activating additional waste treatment units, the Southeast Water Laboratory, Technical Services Division, Federal Water Quality Administration, conducted a 10-day investigation of waste treatment facilities and related stream quality conditions. The report presents the results of this study. (Author)

PB-213 301/5
Environmental Protection Agency, Athens, Ga. Surveillance and Analysis Div.
CONTAINER CORPORATION OF AMERICA BREWTON MILL CONECUH-ESCAMBIA RIVER BASIN STUDY II.

Nov 71, 52p
See also PB-213 300.

Descriptors: (*Water pollution, *Spent liquors (Pulping)), (*Escambia River, Water pollution), (*Industrial waste treatment, Spent liquors (Pulping)), (*Alabama, Water pollution), Paper industry, Conecuh River, Industrial wastes, Biochemical oxygen demand, Water quality, Design, Dissolved gases, Oxygen.
Identifiers: Brewton (Alabama), Escambia County (Alabama), Biological industrial waste treatment, Chemical oxygen demand.

The report contains an evaluation of waste treatment at Container Corporation of America's (CCA) Integrated Pulp and Paper Mill located at Brewton, Alabama. The study was designed to determine the volume of carbonaceous waste generated by increased production, evaluate treatment efficiency and qualify any relative changes in water quality in the Conecuh-Escambia River below CCA's discharge.

PB-213 302/3
Environmental Protection Agency, Athens, Ga. Southeast Water Lab.
CIRCULATION AND BENTHIC CHARACTERIZATION STUDIES ESCAMBIA BAY, FLORIDA.

Feb 71, 51p

Descriptors: (*Water pollution, *Florida), (*Escambia Bay, Water pollution), Tidal currents, Benthos, Sediments, Dredging, Industrial wastes, Nitrogen, Oxygen, Phosphorus, Pensacola Bay, Limnology.
Identifiers: Escambia County (Florida).

The effects of pollution on water quality - Escambia River and Bay, Flor a were investigated during a period of low Escambia River discharge (1,068 cfs) in September and October, 1969. The tidal circulation and bottom sediment characteristics of the bay were reported. Further circulation and more extensive sediment characterization studies were made in June, 1970, at much higher river flows (59,533 cfs). The report presents these results and compares them with those of the 1969 study. Both studies show that Escambia Bay sediments are highly organic and tidal circulation in Upper Escambia Bay is poor. Because of these conditions, sediment disturbances--such as result from dredging--can cause severe oxygen depletion. Massive fish kills could result.

PB-213 304/9
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
A GUIDE TO THE STUDY OF SOLID WASTE SYSTEMS.
Open-file rept.,
Harry R. Little. Dec 71, 49p* TO-1.1.065/0

Descriptors: (*Waste disposal, Evaluation), (*Urban planning, Waste disposal), Forms (Paper), Management planning, Personnel management, Financing, Facilities, Regulations.
Identifiers: *Solid waste disposal.

The paper is intended as a guide to be used by those charged with evaluating solid waste systems and as a report on the present 'state-of-the-art' of engineering-management studies of such systems. The forms and checklists given here are only suggestions as to the types of data that must be collected and evaluated. They are not intended to replace good judgment but only as an aid in its application to the study of solid waste systems.

PB-213 305/7
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
INITIATING A NATIONAL EFFORT TO IMPROVE SOLID WASTE MANAGEMENT.

1972, 115p EPA-SW-14-72

Descriptors: (*Waste disposal, *Government policies), Regulations, National government, Management planning, Urban planning, Project planning.
Identifiers: *Solid waste disposal, Department of Health, Education and Welfare.

With the passage of the Solid Waste Disposal Act in 1965 and the establishment of implementing regulations, the Department of Health, Education, and Welfare (DHEW) assumed major responsibilities for improving solid waste management practices in the United States. This document is a report on accomplishments made by the Department in executing its responsibilities under the Act. Author)

PB-213 306/4
Environmental Prtoection Agency, Athens, Ga. Southeast Water Lab.
PREIMPOUNDMENT STUDY OF WEST POINT LAKE, GEORGIA.
Technical study,
Robert F. Schneider, David W. Hill, M. Ronald Weldon, and Ralph E. Gentry. Jan 72, 200p TS03-71-208-001.2

Descriptors: (*West Point Lake, Water quality), (*Georgia, *Reservoirs), (*Chattahoochee River, *Water quality), Water pollution, Turbidity, Biochemical oxygen demand, Dissolved gases, Oxygen, Nitrogen, Iron, Phosphorus, Manganese, Coliform bacteria, Phytoplankton.
Identifiers: Baseline measurements, Heard County (Georgia), Troup County (Georgia).

The report presents preimpoundment water quality studies on physical, chemical, and biological properties.

PB-213 307/2
Environmental Protection Agency, Athens, Ga. Surveillance and Analysis Div.
PREIMPOUNDMENT STUDY, CARTERS LAKE.
Technical Study rept.

Mar 72, 65p TS03-71-208-001.4

Descriptors: (*Coosawattee River, *Water quality), (*Georgia, Reservoirs), (*Carters Lake, Water quality), Water pollution, Turbidity, Dissolved gases, Oxygen, Sewage, Biochemical oxygen demand, Iron, Manganese, Coliform bacteria.
Identifiers: Baseline measurements, Ellijay (Georgia), Gilmer County (Georgia), Murray County (Georgia).

The Mobile District, Corps of Engineers requested the Southeast Region, Federal Water Pollution Control Administration to make a preimpoundment water quality study of the Coosawattee River at the Carters damsite in Gilmer and Murray Counties, Georgia. Studies needed to answer this request were conducted. The results of this study are presented along with recommendations to improve water quality.

PB-213 308/0
National Environmental Research Center, Cincinnati, Ohio.
MANAGEMENT INFORMATION FOR SOLID WASTE COLLECTION,
Robert M. Clark. Aug 72, 24p EPA-R2-72-011

Descriptors: (*Waste disposal, *Information systems), (*Management planning, Waste disposal), Collecting methods, Cost analysis, Data acquisition, Ohio, Urban areas.
Identifiers: *Solid waste disposal, *Management information systems, Cleveland (Ohio).

The delivery of solid wastes services involves a complex interaction of men, machinery, and politics. Despite these complexities, very little reliable information on solid waste management systems is available to decision makers. In recognition of this problem of data scarcity, a study was initiated on a pilot scale to collect reliable, uniform and continuous data from solid waste collection routes. The purpose of the study was to provide insight and experience into the collections of solid waste data which would be useful for national comparisons. In the paper, the pilot study is discussed, and a case study illustrating the evolution of the pilot study into a management information system for solid waste collection is presented. (Author)

PB-213 311/4
SCS Engineers, Reston, Va.
ANALYSIS OF FEDERAL PROGRAMS AFFECTING SOLID WASTE GENERATION AND RECYCLING.

1972, 160p* EPA-SW-72-4-4
Contract EPA-71-0106

Descriptors: (*Waste disposal, *Government policies), National government, Taxes, Materials recovery, Legislation, Highway planning, Commerce Regulations, Forestry, Auditing, Metal scrap, Rail transportation, Standards, Building codes, Waste papers.
Identifiers: *Solid waste disposal, Waste recycling, Office of Tax Analysis, Federal Trade Commission, Forest Service, General Accounting Office, Interstate Commerce Commission, National Bureau of Standards, Office of Community Development, Department of Defense, General Services Administration, United States Postal Service, National forests, Secondary materials industry, Waste recycling.

Agencies of the Federal government have been assigned the responsibility of carrying out many programs, some of which affect either the generation or recycling of solid wastes throughout the country. The effects on solid waste generation and recycling of most of the approximately 1,000 Federal agencies are minimal or nonexistent; however, some of the Agencies' programs have a very direct effect. The 12 agencies identified as having the most influence are the subject of the report. In addition to determining the extent of the respective agency influences, the report contains several specific recommendations for improving the Federal role in national solid waste management. (Author)

PB-213 313/0
Little (Arthur D.), Inc., Cambridge, Mass.
DEVELOPMENT OF METHODS FOR SAMPLING AND ANALYSIS OF PARTICULATE AND GASEOUS FLUORIDES FROM STATIONARY SOURCES.
Final rept.,
E. T. Peters, J. E. Oberholtzer, and J. R. Valentine. Nov 72, 133p* ADL-73757 EPA-R2-72-126
Contract EPA-68-02-0099

Descriptors: (*Air pollution, *Gas analysis), (*Fluorides, Gas analysis), (*Particles, Gas analysis), (*Flue gases, *Gas sampling), Industrial wastes, Chemical analysis, Aluminum industry, Iron and steel industry, Glass industry, Beneficiation, Phosphate deposits, Reviews, Flow charting, Potentiometric analysis, Electrodes, Cryolite, Distillation, X ray analysis, Errors.
Identifiers: *Air pollution detection, Phosphate industry, *Ion selective electrodes.

A study was conducted which has resulted in the development of tentative sampling and analysis of fluorides emitted from various stationary sources. The study was directed toward developing and understanding the kinds of species which are present in each source emission. The report presents the following information: A review of the various unit processes within the primary aluminum, iron and steel, glass, and phosphate processing industries; industry flow diagrams which include estimates of fluoride throughout; and an inventory of emission species found within each process; Descriptions of sampling apparatus and procedures for gaseous and particulate fluorides, evaluations of the reactivity of sampling train components and sample container materials in the presence of fluoride ion, and a description of recommended apparatus for each industry; Development of analytical methods for measuring fluoride ion; Analysis of field samples collected from each industry to identify the chemical species present and to evaluate the suitability of developed analytical methods for measuring fluoride; and Recommendations for tentative sampling and analysis methods for gaseous and particulate fluoride. (Author)

PB-213 337/9
Environmental Protection Agency, Washington, D.C. Office of Research and Monitoring.
EXPRO 73. A LISTING OF EXTRAMURAL PROJECTS TO BE FUNDED IN FISCAL YEAR 1973.

Oct 72, 254p*

Descriptors: (*Pollution, *Contract administration), (*Air pollution, Contract administration), (*Water pollution, Contract administration), Research management, Public health, National government, Ecology, Gas analysis, Fuel additives, Water analysis, Sewage treatment, Radiation effects, Industrial waste treatment, Sources, Waste disposal.
Identifiers: *Solid waste disposal, Minority owned enterprises, Electromagnetic radiation hazards.

The report has two purposes: To acquaint the research and development community with general guidelines for working with the Environmental Protection Agency's Office of Research and Monitoring (OR and M) under grant or contract support; and To make publically available a list of specific grant and contract Tasks which OR and M plans to fund during the current Fiscal Year-1973. The Task list will be up-dated quarterly (at least initially) and will include only those Tasks for which a grantee or contractor has not already been selected and for which current-year funds remain available. The areas of research involve air, solid waste, radiation, water hygiene and noise, water, hazardous materials, and agricultural practices, and pesticide regulation.

PB-213 340/3
National Analysts, Inc., Philadelphia, Pa.
METROPOLITAN HOUSEWIVES' ATTITUDES TOWARD SOLID WASTE DISPOSAL.

Sep 72, 114p* EPA-R5-72-003
Contract EPA-68-03-0059

Descriptors: (*Refuse disposal, *Attitude surveys), (*Public opinion, Refuse disposal), Questionnaires, Education, Publicity, Acceptability, Materials recovery.
Identifiers: *Solid waste disposal, Waste recycling.

When enlisting the citizen's help to alleviate our environmental problems, it is important to understand their attitudes and knowledge. Are housewives willing to separate their trash at home. Who do they believe is responsible for pollution or for cleaning it up. The answers to these and other questions found in the survey should be of help to planners and designers; in this way, educational and other programs can be drawn to secure maximum cooperation. (Author)

PB-213 341/1
Research Triangle Inst., Durham, N.C.
THE BEVERAGE CONTAINER PROBLEM. ANALYSIS AND RECOMMENDATIONS.
Tayler H. Bingham, and R. H. Ongerth. Sep 72, 201p* EPA-R2-72-059
Contract EPA-68-03-0038

Descriptors: (*Waste disposal, Containers), (*Containers, *Government policies), (*Beverages, Containers), National government, Bottles, Cans, Glass, Steels, Aluminum, Cost analysis, Legislation, Taxes, Education, Materials recovery, Demand (Economics), State government.
Identifiers: *Beverage containers, *Solid waste disposal, Litter, Container deposits, Waste recycling, Elasticity of demand.

The study includes 2 principle elements: The analyses of 3 types of environmental concern that might be cited as the rationale for a beverage container policy; and The analyses and evaluation of alternative governmental policies for beverage containers, and resulting recommendations. Three types of environmental dimensions to beverage containers were examined as possible bases for government action. These were: The resource dimensions to beverage container production, especially nonrefillable containers; The solid waste dimensions of discarded beverage containers; and The amenities dimensions of littered beverage containers. It is concluded that beverage containers are an environmental problem primarily because some consumers of beverages litter their empty containers rather than disposing of them properly. (Author)

PB-213 342/9
Lockheed Missiles and Space Co., Sunnyvale, Calif. Ground Vehicle Systems.
FLYWHEEL DRIVE SYSTEMS STUDY.
Final rept.,
R. R. Gilbert, G. E. Heuer, and E. H. Jacobsen. 31 Jul 72, 292p* LMSC-D246393 APTD-1182
Contract EPA-68-04-0048

Descriptors: (*Motor vehicles, Flywheels), (*Automobile engines, *Flywheels), (*Air pollution, *Exhaust gases), (*Automobile transmission, Design), Feasibility, Performance evaluation, Specifications, Burst tests, Kinetic energy, Safety engineering, Hydrocarbons, Nitrogen oxides, Carbon monoxide, Computer programs, BASIC programming language.
Identifiers: *Air pollution abatement, *Hybrid vehicular propulsion, *Automobile exhaust.

The systems study effort has been directed toward the verification and refinement of the conclusions reached in a previous study, which indicated that the fly wheel hybrid drive concept might be a technically feasible way to power a full size automobile. The present study makes use of more detailed input information on engine emissions on transmission characteristics. These data are augmented by detailed flywheel technology studies and test results to provide the background for more precise conclusions regarding the flywheel drive concept. The results do indicate that the flywheel bybrid drive concept is a technically feasible propulsion system for a full size automobile. The report describes the work done to accomplish the following goals: advance the development of flywheel systems technology including the development of final designs on conformal housings, bearings, seals, and evacuation systems; demonstrate positive flywheel energy containment in burst tests of flywheels; formulate safety analyses, using fault-tree and gross-hazard methodologies, produce engine-mapping project data to permit calculation of engine emission data resulting from flywheel drive operations. (Author)

PB-213 347/8
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
LOWER RIO GRANDE VALLEY REGIONAL PLAN FOR SOLID WASTE DISPOSAL UTILIZING RAIL HAUL.
Open file rept.,
J. F. Malina, Jr., and B. F. Martin. 1971, 84p EPA-SW-5tg-71

Descriptors: (*Waste disposal, *Texas), (*Rio Grande Valley, Waste disposal), Rail transportation, Regional planning, Earthfills, Collecting methods, Cost estimates.
Identifiers: *Solid waste disposal, Sanitary landfills, Cameron County (Texas), Hidalgo County (Texas).

The objective of the study was to develop a regional approach to solid wastes management for the Lower Rio Grande Valley (Cameron and Hidalgo Counties) in the State of Texas. The solid waste production was determined by weighing the municipal refuse and brush collected by trucks in several communities in the Valley. A secondary objective was the investigation of the feasibility of utilizing the existing railroad system as an integral part of the regional refuse disposal operation. Economic factors indicate the rail-haul may be the best method for removing refuse. Recommendations are given.

PB-213 349/4
Environmental Protection Agency, Athens, Ga. Southeast Water Lab.
REPORT ON POLLUTION OF THE ST. MARYS AND AMELIA ESTUARIES GEORGIA - FLORIDA,
Thomas P. Gallager. Aug 71, 52p

Descriptors: (*Water pollution, *Florida), (*Georgia, Water pollution), Industrial wastes, Sewage, Spent liquors (Pulping), Saint Marys Estuary, Paper industry, Water quality, Dissolved gases, Oxygen, Amelia Estuary.
Identifiers: Fernandina Beach (Florida), Saint Marys (Georgia), Nassau County (Florida), Camden County (Georgia), Sewage treatment effluent.

The discharge of untreated and inadequately treated municipal and industrial wastes into the Amelia River, St. Marys River, and tributary streams caused serious water quality degradation and interfered with water uses in the coastal waters of Georgia and Florida. Untreated wastes discharged from the Rayonier, Inc. and Container Corporation of America paper mills and inadequately treated sewage from the City of Fernandina Beach are the main offenders. The report presents the results of a study of the water quality of this area and recommendations for improvement.

PB-213 366/8
Naval Research Lab., Washington, D.C.
DEVELOPMENT OF X-RAY FLUORESCENCE SPECTROSCOPY FOR ELEMENTAL ANALYSIS OF PARTICULATE MATTER IN THE ATMOSPHERE AND IN SOURCE EMISSIONS,
L. S. Birks, J. V. Gilfrich, and P. G. Burkhalter.
Oct 72, 48p EPA-R2-72-063

Descriptors: (*Air pollution, Particles), (*Particles, *X-ray fluorescence), (*Spectrochemical analysis, Particles), Trace elements, Air filters, Sensitivity, Particle size, X-ray analysis, Excitation, Microanalysis.
Identifiers: *Air pollution detection.

The application of x-ray fluorescence to the analysis of air pollution particulate samples was demonstrated to be a rapid and economical technique at concentrations encountered in practical situations. No sample preparation is necessary for particulates deposited on filters, which can be placed directly in the x-ray equipment. Because the specimens are thin, matrix absorption and fluorescence are negligible and calibration curves are linear. All of the elements of interest can be measured simultaneously in 100 seconds with either multichannel x-ray crystal spectrometers or multichannel analyzers with energy dispersion detectors. Sensitivity and detectability were compared for four types of excitation (x-ray tubes, fluorescers, radioisotopes and high-energy ions) and for the two types of data acquisition (crystal spectrometers and energy dispersive detectors). (Author)

PB-213 370/0
General Electric Co., Cincinnati, Ohio. Space Div.
AUTOMOBILE GAS TURBINE - OPTIMUM CYCLE SELECTION STUDY.
Final rept.,
R. J. Rossbach. Jun 72, 337p* GESP-725FS
APTD-1343
Contract EPA-68-01-0406

Descriptors: (*Automobile engines, *Gas turbine engines), Design, Abatement, Air pollution, Exhaust gases, Performance evaluation, Gas compressors, Heat exchangers, Cost estimates, Maintenance, Recommendations, Regenerators.
Identifiers: *Air pollution abatement, Recuperators.

The study was conducted with the following objectives: To define the optimum gas turbine engine (s) capable of meeting the 1976 Federal Standards on automobile emissions and capable of being developed by the year 1975; To present recommendations for the development and demonstration of the selected optimum engine (s) by 1975 and for mass production of vehicles powered by such engines at earliest possible date after 1975. In the report an analysis and preliminary design program was carried out. First ten gas-turbine engine types were screened by establishing the baseline technology, by carrying out a design Point Cycle Study, and finally by making a preliminary selection of three engine types. Off design analysis, mission analysis, and economic analysis were performed on the two engines which were finally selected. However, the amounts and types of exhaust emissions were not studied. (Author)

PB-213 372/6
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
FINANCING SOLID WASTE MANAGEMENT IN SMALL COMMUNITIES.

1972, 16p EPA-SW-57ts
Paper copy also available from GPO $0.25 as stock no. 5502-0022.

Descriptors: (*Waste disposal, *Financing), Urban planning, Communities, Management planning, Local government, Leasing.
Identifiers: *Bond issues, *Solid waste disposal.

The paper discusses the three major financing techniques (pay-as-you-go, leasing, and long-term borrowing) as they apply to solid waste disposal in small communities. More indirect methods, such as private contracting or grants utilization, are not considered.

PB-213 374/2
Institute of Public Administration, Washington, D.C.
EVALUATING TRANSPORTATION CONTROLS TO REDUCE MOTOR VEHICLE EMISSIONS IN MAJOR METROPOLITAN AREAS.
Interim rept.

16 Mar 72, 367p* APTD-1118
Contract EPA-68-02-0048
Prepared in cooperation with Teknekron, Inc., Washington, D.C.

Descriptors: (*Air pollution, *Exhaust gases), (*Urban planning, Air pollution), (*Urban transportation, Air pollution), Motor vehicles, Feasibility, Cost estimates, Carbon monoxide, Abatement, Automotive fuels, Liquefied natural gas, Natural gas, Gasoline, Vehicular traffic control, Mass transportation, Buses (Vehicles), Rapid transit railways, Predictions, Maintenance.
Identifiers: Automobile exhaust, *Air pollution abatement, Taxicabs, Working hours, Motor vehicle inspection.

The overall objective was to evaluate transportation controls to reduce motor vehicle emissions in major metropolitan areas. An appreciation of transportation controls was made, and their effectiveness in reducing emissions, their feasibility, and the probable costs were assessed. The transportation controls which could conceivably reduce motor vehicle emissions in the next few years are described and evaluated. The intent was to provide assistance in the preparation of transportation components of state implementation plans. In most of the metropolitan areas under study, overall CO emission reductions of at least 50 percent from existing levels appear required to meet the national ambient air standards by 1975. Most transportation controls that are capable of being introduced in the next few years offer the potential for only modest reductions. All controls would entail very substantial implementation costs which are discussed.

PB-213 375/0
Bureau of Community Environmental Management, Rockville, Md.
ENVIRONMENTAL HEALTH PLANNING.

1971, 135p PHS-Pub-2120
Report on Community Environmental Management Series.
Paper copy available from GPO $1.50 as HE20.1810:H34.

Descriptors: (*Regional planning, Public health), (*Public health, *Pollution), (*Urban planning, Public health), (*Government policies, Public health), Project planning, Air pollution, Water pollution, Waste disposal, Radiation effects, Pesticides, Disease vectors, Industrial medicine, Noise reduction, Recreation, Food sanitation, Drugs, Injuries, Houses, Local government, State government.
Identifiers: Noise pollution, Solid waste disposal.

The manual is intended to guide state and local environmental health planners and managers in development of appropriate and effective programs through systematic planning--either for the development of new programs or the evaluation and upgrading of existing ones. The first chapter provides basic planning information while subsequent chapters discuss special considerations relating to planning state or local programs in each of the principal environmental health areas. (Author)

PB-213 376/7
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
AMERICAN COMPOSTING CONCEPTS,
P. H. McGauhey. 1971, 30p EPA-SW-2r
Library of Congress Catalog Card no. 70-608444.
Paper copy available from GPO $0.25 as EP3.2:C73.

Descriptors: (*Waste disposal, *Composts), Reviews, Refuse disposal, Fertilizers, Cost analysis, Earth fills, Industrial plants.
Identifiers: *Solid waste disposal.

The author reviews the use of composting as a means of solid waste disposal and as a means of salvaging organic matter. Discussed are the values of compost as a soil conditioner, costs involved, and its use in landfill.

PB-213 377/5
National Environmental Research Center, Research Triangle Park, N.C.
CASCADE IMPACTOR NETWORK,
Robert E. Lee, Jr., and Stephen Goranson. Jul 72, 132p AP-108
Paper copy available from GPO $1.00 as EP4.9:180.

Descriptors: (*Air pollution, Particles), (*Urban areas, Air pollution), Impactors, Samplers, Particle size distribution, Gravimetric analysis, Seasonal variations, District of Columbia, Illinois, Ohio, Colorado, Missouri, Pennsylvania.
Identifiers: *Air quality data, Cascade impactors, High volume samplers, Chicago (Illinois), Cincinnati (Ohio), Denver (Colorado), Philadelphia (Pennsylvania), Saint Louis (Missouri).

An experimental network of modified cascade impactors was set up, as part of the National Air Surveillance Network, to determine gravimetrically the particle size distribution of suspended particulate matter in the air in six urban areas. The modified cascade impactor, the analytical methodology, and the computer processing of data are described. Results of the first year's operation indicate that suspended particulate matter in urban air is predominantly submicron in size (expressed as equivalent spheres of unit density). Variations in the quarterly composites of mass median diameter, various size fractions less than or equal to 1 and 2 microns, and the degree of particle dispersion expressed by the geometric deviation generally followed seasonal patterns. Future expansion of the network is discussed. (Author)

PB-213 378/3
Battelle Columbus Labs., Ohio.
CORROSION STUDIES IN MUNICIPAL INCINERATORS.

1972, 129p EPA-SW-72-3-3
Contract EP-00325, EP-00325-S1

Descriptors: (*Incinerators, *Corrosion), (*Waste disposal, Incinerators), (*Scrubbers, Corrosion), Corrosion tests, Protective coatings, Corrosion prevention, Combustion products, Data, Corrosive gases.
Identifiers: Solid waste disposal.

Corrosion probes of 11 alloys were placed in 2 municipal incinerators, one refractory lined and the other a water wall. After the probes were exposed to varying temperatures, times, and conditions, some of the conclusions included: metal-wastage rates are temperature dependent; water-wall incinerators should not be used to generate high-temperature superheated steam; hydrogen chloride and sulfur dioxide in the flue gases were of sufficient concentration to be of concern and account for the types of deposits found on the tubes; roles played by the sulfur- and chlorine-containing compounds in the refuse are of great importance and are closely interrelated; zinc and lead further complicate the corrosion process; non-metallic materials should be considered as coating for wet scrubbers of incinerator gases; corrosion of incinerator grates is not a serious problem. (Author)

PB-213 379/1
National Environmental Research Center, Cincinnati, Ohio. Analytical Quality Control Lab.
REFERENCES FOR THE IDENTIFICATION OF FRESHWATER MACROINVERTEBRATES.
Environmental monitoring series,
Philip A. Lewis. Oct 72, 23p EPA-R4-72-006

Descriptors: (*Water pollution, Invertebrates), (*Invertebrates, *Aquatic animals), (*Indicator species, Water pollution), (*Freshwater biology, Invertebrates), (*Bibliographies, Invertebrates), Identifying, Annelida, Arthropoda, Crustacea, Bryozoa, Mollusca, Platyhelminthes.

As part of the research work involved in protecting the environment, macroinvertebrates are used as indicators of freshwater pollution. The references included in the bibliography were chosen as being particularly pertinent to aid the field and laboratory scientist and the student identify these important organisms.

PB-213 386/6
Fats and Proteins Research Foundation, Inc., Des Plaines, Ill.
INVESTIGATION OF ODOR CONTROL IN THE RENDERING INDUSTRY,
D. M. Doty, R. H. Snow, and H. G. Reilich. Oct 72, 152p* EPA-R2-72-088
Contract EPA-68-02-0260

Descriptors: (*Air pollution control equipment, *Odor control), (*Scrubbers, Odor control), Air pollution, Design, Performance evaluation, Cost estimates, Oxidizers, Sodium hypochlorite, Food processing, Industrial plants, Afterburners, Combustion, Adsorption, Activated carbon treatment, Capital costs, Operating costs, Incinerators, Gas analysis.
Identifiers: *Rendering plants, *Air pollution control.

The control of rendering plant odors was investigated, both as to equipment cost and design, and experimental performance. The design studies indicated that scrubbers are the most economical method. The compounds mainly responsible for rendering odors were identified. Exploratory bubbler tests were done with a list of scrubbing reagents, and the most promising were further tested in a packed scrubbing column of pilot size. Other systems tested but not as economical included direct fired incinerators, catalytic bed afterburners, and carbon bed adsorption.

PB-213 389/0
AiResearch Mfg. Co. of Arizona, Phoenix.
AUTOMOBILE GAS TURBINE OPTIMIZATION STUDY.
Final rept.

14 Jul 72, 414p AT-6100-R7 APTD-1291
Contract EPA-68-04-0012

Descriptors: (*Gas turbine engines, Performance evaluation), (*Automobiles, Motor vehicle engines), Air pollution, Emission, Design criteria, Combustion chambers, Automotive transmissions, Fuel consumption, Cost analysis, Economic analysis.

A study was conducted for the purpose of defining the optimum gas turbine engine capable of meeting the 1976 emission standards, when used in the largest-selling size classification of U.S. automobiles and capable of being developed by the year 1975. This study approach was to perform limited analyses, consisting of design-point cycle studies of a large number of potential candidate automobile engines comprising single-shaft, free-turbine and multiple spool configurations. Cycle pressure ratios and temperatures, with turbine cooling flow rates, were varied, thus providing sufficient information to estimate qualitatively the part load performance of each engine. In these analyses, the effects of cycle modifiers were determined. Twelve cycles were chosen for off-design performance analysis over the entire operating range of each engine. (Author)

PB-213 394/0
National Environmental Research Center, Cincinnati, Ohio.
URBAN SOLID WASTE MANAGEMENT. ECONOMIC CASE STUDY,
Robert M. Clark. Aug 72, 26p* EPA-R2-72-012

Descriptors: (*Waste disposal, *Cost analysis), (*Urban planning, Waste disposal), Management planning, Productivity, Cost estimates, Economic analysis, Labor estimates, Operating costs, Capital costs.
Identifiers: *Solid waste disposal.

Little has been written about the operational and economic problems affecting specific communities on solid waste problems. To provide some insight into local problems, a case-study approach was used to examine a sample midwestern city (approximately 500,000 population) with solid waste management problems similar to most other medium-to-large urban communities. Changes in the productivity of solid waste collection crews brought about by substituting capital for labor are studied. The economic effects of solid waste management costs on residents are analyzed by comparing solid waste costs with disposable income. (Author)

PB-213 410/4
IIT Research Inst., Chicago, Ill.
TECHNICAL EVALUATION OF PHOSPHATE-FREE HOME LAUNDRY DETERGENTS.
Water pollution control research series,
Helmut G. Reilich. Feb 72, 128p W73-02351, EPA-WQA-16080-DVF-02-72
Contract FWQA-14-12-937
Paper copy available from GPO $1.25 as EP1.16:16080DVF 02/72.

Descriptors: (*Detergents, Performance evaluation), (*Surfactants, Detergents), (*Water pollution, Detergents), (*Sulfonates, Detergents), Sulfonamides, Formulations, Synthesis (Chemistry), Toxicology, Fishes, Algae, Nutrients, Carboxymethyl cellulose.
Identifiers: Water pollution abatement, *Phosphate free detergents, Water hardness.

Phosphate-free detergents, using three surfactants which would be acceptable substitutes for conventional home laundry products, were formulated and evaluated. These surfactants are relatively safe, non-polluting, and biodegradable. The formulations are effective over a considerable water hardness range. Two of the surfactants investigated are about equally capable of yielding detergent formulations of high promise. All formulations contained 20% of the selected surfactant (a sulfonate or sulfonamide) and 2% carboxymethylcellulose (CMC). Possible substitutes or optimum use level were not investigated. Although the point was not pursued as a specific end, indications are that use of these surfactants may lead to detergent formulations of lower basicity than currently in use, rendering them safer and less corrosive. The formulation of choice had good overall detergent properties performing well under all test conditions and is essentially free of potentially polluting substances. Limited biological testing of these surfactants indicates safety relative to fish toxicity and lack of algal stimulating properties.

PB-213 417/9
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
HEAT-ENGINE/MECHANICAL-ENERGY--STORAGE HYBRID PROPULSION SYSTEMS FOR VEHICLES.
Final rept.,
G. L. Dugger, A. Brandt, J. F. George, L. L. Perini, and D. W. Rabenhorst. Mar 72, 312p* APL-CP-011 APTD-1344
Contract N00017-62-C-0604
Report on Air Pollution Control.

Descriptors: (*Motor vehicle drive systems, *Flywheels), (*Automobile engines, Flywheels), (*Air pollution, Exhaust gases), (*Reinforced plastics, Flywheels), Buses (Vehicles), Performance standards, Design, Energy storage, Stresses, Failure, Automobile transmissions, Safety engineering, Disintegration, Epoxy resins, Fiberglass reinforced plastics.
Identifiers: *Air pollution abatement, *Hybrid vehicular propulsion, Automobile exhaust, Carbon reinforced plastics, Boron reinforced plastics.

An analytical study indicated that a flywheel-only propulsion system could satisfy specified performance requirements for a city bus, and that flywheel/heat engine hybrids could meet the specified requirements for cars, vans, and buses. In all cases substantial emission-free ranges could be achieved with hybrid systems by using the engine only periodically (at constant load) to recharge a large, high-energy flywheel. Experiments verified the principle of the superflywheel by spin tests of unindirectional materials in rod or bar rotor configurations. The better results demonstrated energy densities greater than 30 W-h/lb (max. ± 18) for boron filaments and slender rods of graphite and glass composites. Composite flywheels will be much easier to contain than metal flywheels and are promising candidates for energy storage devices. (Author)

PB-213 421/1
Kellogg (M. W.) Co., Piscataway, N.J.
APPLICABILITY OF SO2-CONTROL PROCESSES TO POWER PLANTS.
Final rept.,
J. A. McSorley. Nov 72, 79p* EPA-R2-72-100
Contract CPA-70-68

Descriptors: (*Electric power plants, *Air pollution control equipment), (*Sulfur dioxide, Air pollution control equipment), (*Scrubbers, Air pollution control equipment), Cost estimates, Installing, Oil, Coal, Limestone, Ammonia, Magnesium oxides, Adsorbents, Calcium oxides, Chemical engineering, Capital costs, Waste disposal, Regeneration (Engineering), Materials recovery, Air pollution.
Identifiers: Air pollution economics, Alkaline scrubbing, Limestone scrubbing, Ammonia scrubbing, Magnesium oxide scrubbing, Wellman-Lord process, Waste gas recovery, Stone and Webster process, *Air pollution control.

The report describes and discusses the work undertaken in a study which proposed to determine the extent to which SO2-control units can be installed in existing oil- and coal-fired power plants. In this, and a previous similar study, 14 different power systems were evaluated having a total oil- and coal-fired generating capacity of 88,520 megawatts of which 78% had adequate space for retrofitting scrubbers. To obtain an indication of installation costs, a qualitative retrofit complexity factor was estimated for each boiler unit studied by considering such items as space availability, site assessibility, and degree of plant modification. The complexity factor relates the cost of retrofitting a control system to the cost of the same system installed on a new power plant. The distribution of relative operating costs over generating capacity was also calculated.

PB-213 438/5
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
PLANNING FOR SOLID WASTE MANAGEMENT. SYMPOSIUM OF STATE AND INTERSTATE SOLID WASTE PLANNING AGENCIES, SEPTEMBER 9-11, 1969, ST. LOUIS, MISSOURI.

1971, 90p EPA-SW-2p
Library of Congress Catalog Card no. 71-611731.
Paper copy available from GPO $0.45 as stock no. 5502-3307; EP3.2:oc 2.

Descriptors: (*Waste disposal, Meetings), Management planning, Regional planning, Data acquisition, Government policies, National government, State government, Local government, Legislation.
Identifiers: *Solid waste disposal.

The report presents the texts of the reports and discussions occurring at the conference. They include: Planning for solid waste disposal; America's biggest industry-The production of waste; The planning process; Data for solid waste planning; Intergovernmental cooperation and public involvement in solid waste management; Solid waste legislation; and Implementation of solid waste management plans.

PB-213 441/9
New Mexico State Univ., University Park. Physical Science Lab.
FLOATING OIL RECOVERY DEVICE.

Feb 71, 76p EPA-15080-FWO-02/71
Contract EPA-14-12-903
Paper copy available from GPO $1.00 as stock no. 5501-0116.

Descriptors: (*Water pollution, Oils), (*Skimmers, *Oils), (*Absorbers (Equipment), Oils), Viscosity, Materials recovery, Catamarans, Performance evaluation, Belt conveyors, Design, Tests.
Identifiers: *Oil pollution removal, Oil pollution control.

Flow bench tests of a model rotating belt-Couette flow oil recovery device were conducted to evaluate its use in oil spill cleanup. These tests revealed that the device is capable of harvesting oils over a broad range of viscosities at the rates and purities specified by the EPA, if the inlet can be made to 'track' the water surface. Analyses were conducted to design a catamaran vessel suitable for mounting the Oil Pickup Unit (OPU) and also providing the requisite surface following performance. Vessel response analyses showed that the required surface following behavior cannot be provided by the catamaran itself, but can be achieved by floating the OPU and decoupling this assembly from the vessel in heave and surge.

PB-213 442/7
Southwest Research Inst., San Antonio, Tex.
IMPREGNATION OF CONCRETE PIPE.

Jun 71, 78p EPA-11024-EQE-06/71
Contract EPA-14-12-835
Paper copy available from GPO $0.75, as stock no. 5501-0601. EP2.10:11024-EQE-06/71.

Descriptors: (*Concrete pipes, Impregnating), (*Corrosion prevention, Concrete pipes), Sewers, Permeability, Polymers, Coal tar, Linseed oil, Sulfur, Urea, Formaldehyde, Exposure.

The program was undertaken to investigate methods to increase the corrosion resistance, increase the strength, and reduce the permeability of concrete used in sewer line applications by impregnating the concrete pipe with relatively low cost resins such as asphalt, coal tars, linseed oil, sulfur, urea-formaldehyde, and others. Methods to accomplish this end were achieved and the materials, techniques of application, test results and economics are presented in this report. (Author)

PB-213 443/5
Minnesota Univ., Minneapolis. St. Anthony Falls Hydraulic Lab.
HYDRAULICS OF LONG VERTICAL CONDUITS AND ASSOCIATED CAVITATION.
Jun 71, 52p EPA-11034-FLU-06/71
Contract EPA-14-12-861
Paper copy available from GPO $0.60 as stock no. EP2.10:11034-FLU-06/71.

Descriptors: (*Storm sewers, Design), (*Cavitation, Storm sewers), Hydraulics, Head (Fluid mechanics), Two phase flow.

Experimental studies were undertaken to examine the flow in long vertical conduits with particular reference to the design of storm water drop shafts. A distinguishing characteristic of such flow is the potential cavitation regime. Its existence depends upon the design of the structure. The cavitation regime will develop when the conduit is sufficiently long and the head sufficiently large. It can also be generated at a lower head if a control valve is installed in the supply line so that the net head can be negative. If a small amount of air is introduced into the system, the cavitation region is eliminated, the pressure gradient is more uniform, and the flow consists of a uniform mixture of air and water. (Author)

PB-213 444/3
Stanford Research Inst., Menlo Park, Calif.
DISPOSAL OF POLYMER SOLID WASTES BY PRIMARY POLYMER PRODUCERS AND PLASTICS FABRICATORS,
Chester W. Marynowski. 1972, 103p* EPA-SW-34C
Contract PH-86-68-160
Paper copy available from GPO $1.00 as stock no. EP1.17:34C.

Descriptors: (*Plastics, *Waste disposal), (*Industrial waste treatment, Plastics), Reviews, Polyethylene, Polypropylene, Polyvinyl chloride, Polystyrene, Thermoplastics, Inventories, Sources, Chemical industry, Earth fills, Biodeterioration, Oxidation, Incinerators, Combustion, Pyrolysis, Questionnaires, Surveys.
Identifiers: *Solid waste disposal, *Plastics industry, Sanitary landfills, Pyrolysis incineration.

The report deals exclusively with the industrial, or 'pre-consumer' part of the polymer solid waste problem. It explores the nature and extent of the problem in the United States for that segment of the plastics industry representing the largest product tonnage; namely, the segment dealing in the production and fabrication of the principal thermoplastics. It presents technical and economic information on polymer waste disposal methods in actual use, and evaluates alternative approaches to polymer solid waste disposal. (Author)

PB-213 445/1
Environmental Protection Agency, Athens, Ga. Southwest Water Lab.
A STUDY OF COASTAL WATER QUALITY IN THE VICINITY OF SAN JUAN, PUERTO RICO, JANUARY 13-31, 1971.

Feb 71, 41p

Descriptors: (*Water quality, *Puerto Rico), (*Water pollution, Puerto Rico), Dissolved gases, Oxygen, Temperature, Bacteria, Solids, Sediments, Plankton, pH, Coasts, Oils, Standards.
Identifiers: *San Juan (Puerto Rico), Water pollution standards.

A water quality investigation in the coastal environs of the greater San Juan, Puerto Rico, area was conducted during the period January 13-31, 1971. The primary purpose of the study was to document the extent of water pollution in the San Juan area with particular reference to violations of Puerto Rico's Coastal Water Quality Standards.

PB-213 472/4
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
RECOMMENDED STANDARDS FOR SANITARY LANDFILL DESIGN, CONSTRUCTION, AND EVALUATION AND MODEL SANITARY LANDFILL OPERATION AGREEMENT.

1971, 25p* EPA-SW-86ts
Prepared in cooperation with National Solid Wastes Management and Federal Solid Waste Management Program. See also report dated 1971, PB-203 623.

Descriptors: (*Waste disposal, *Earth fills), (*Sanitary engineering, Earth fills), Standards, Acceptability, Evaluation, Site surveys, Operations, Design, Contract administration, Urban planning.
Identifiers: *Solid waste disposal, *Sanitary landfills.

The report provides information to help designers, operators, and control agencies achieve and maintain good sanitary landfill practices. Recommendations suggest basic requirements involved in designing and constructing a sanitary landfill. An evaluation method has been developed to measure the level of acceptability of the operations taking place at a disposal site and to provide a comparison of its suitability with that of other evaluated sites. The evaluation provides a tool that a community, organization, consultant, or citizen can use to judge the design and construction of any site under consideration. Also presented are provisions which should be included in instructions to landfill bidders. A model sanitary landfill operation agreement form is shown.

PB-213 473/2
Dillingham Corp., La Jolla, Calif. Applied Oceanography Div.
OCEAN DISPOSAL OF BARGE-DELIVERED LIQUID AND SOLID WASTES FROM U.S. COASTAL CITIES,
David D. Smith, and Robert P. Brown. 1971, 121p EPA-SW-19c
Contract PH-86-68-203
Paper copy available from GPO $1.25 as stock no. 5502-0035, EP3.2:P69.

Descriptors: (*Waste disposal, *Oceans), (*Water pollution, Waste disposal), Sludge disposal, Industrial wastes, Ships, Barges, Marine biology, Ecology, Spoil, Inorganic acids, Refuse disposal, Radioactive wastes, Project planning, Monitors, Urban planning, Reviews, Law (Jurisprudence), International law, Regulations, National government, State government.
Identifiers: *Solid waste disposal, *Liquid waste disposal, *Ocean waste disposal.

The report summarizes the results of a field survey of twenty U.S. coastal cities to appraise the national status of oceanic disposal of solid wastes and industrial sludges from ships and barges. The inventory of solid wastes and industrial sludges included construction and demolition debris, dredge spoils, sewage sludge, and spent acids. The objectives were: To determine the nature and magnitude of present oceanic disposal practices from major U.S. coastal cities; To evaluate what is known regarding the effects of these wastes on the marine environment, and particularly, the biota; To summarize the legal framework under which these disposal operations are carried out; To determine the status of regulatory monitoring of these operations; and To identify those aspects of marine disposal which are problem areas and make appropriate recommendations.

PB-213 476/5
National Environmental Research Center, Cincinnati, Ohio.
VIRUSES IN WASTE, RENOVATED, AND OTHER WATERS. 1971 LITERATURE ABSTRACTS,
Gerald Berg, and F. Dianne White. 1971, 28p*

Descriptors: (*Water pollution, *Viruses), (*Abstracts, Viruses), (*Disinfection, Viruses), (*Water treatment, Viruses), Epidemiology, Public health, Ground water, Sewage, Enteroviruses, ECHO virus, Microorganism control (Water), Polioviruses, Sewage treatment, Water analysis, Halogens, Shellfish, Hepatitis, Oceans.

The report is an annotated bibliography containing more than 87 abstracts of articles appearing in the open literature in 1971. They are concerned with viruses in waste, renovated, and other waters. The subjects include water treatment methods, epidemiology, public health, sewage treatment, and analytical techniques.

PB-213 478/1
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
COMPOSTING OF MUNICIPAL SOLID WASTES IN THE UNITED STATES,
Andrew W. Breidenbach. 1971, 111p EPA-SW-47r
Paper copy available from GPO $1.00 as stock no. 5502-0033.

Descriptors: (*Waste disposal, *Composts), Reviews, Industrial plants, Refuse disposal, Cost estimates, Capital costs, Operating costs, Utilization, Marketing, Bacteria, Economic analysis, Chemical analysis, Tennessee.
Identifiers: *Solid waste disposal, Johnson City (Tennessee).

The report contains the following sections on composting: Composting technology; Processing systems, types of plants, and a listing of municipal composting plants and their status as of December 1969. Broad engineering, chemical, and microbiological aspects of composting municipal refuse, with and without the addition of other organic wastes; Capital and operating costs for the research and development plant at Johnson City, Tennessee and the demonstration plant at Gainesville, Tennessee. Preliminary compost utilization and marketing studies; and the role composting is expected to have in future solid waste management systems.

PB-213 482/3
National Environmental Research Center, Cincinnati, Ohio.
AN INVESTMENT DECISION MODEL FOR CONTROL TECHNOLOGY.
Socioeconomic environmental studies series.
Robert M. Clark. Sep 72, 22p* EPA-R5-72-004

Descriptors: (*Waste treatment, *Financing), (*Water treatment, Financing), (*Sewage treatment, Financing), (*Industrial waste treatment, Financing), Waste disposal, Air pollution, Water pollution, Mathematical models, Decision making, Management planning, Urban planning, Cost estimates, Capital costs, Operating costs, Taxes, Linear programming.
Identifiers: *Air pollution control, *Water pollution control, *Solid waste disposal.

Investment decisions in control technology for environmental management are similar to those in other areas of public finance. These decisions, which may include the decision to construct a water or wastewater treatment system or an incinerator, depend on adequate financial support, which means not only availability of money in sufficient quantity, but also at the time when needed. A mathematical model, incorporating borrowing and lending variables, has been structured to provide an efficient method of studying the problem. The model formulation assumes that investment decisions for control technology can be separated into a total operating and capital cost decision and an investment cost decision. These costs are minimized in 2 stages. The first stage uses a fixed-charge algorithm and the second stage, a linear programming algorithm. (Author)

PB-213 483/1
Edison Water Quality Research Lab., N. J.
BIOLOGICAL EFFECTS OF OIL POLLUTION SELECTED BIBLIOGRAPHY II,
Royal J. Nadeau, and Thomas H. Roush. Nov 72, 61p* EPA-R2-72-055
See also report dated Oct 69, PB-188 206.

Descriptors: (*Water pollution, Oils), (*Aquatic biology, *Oils), (*Bibliographies, Water pollution), Ecology, Aquatic animals, Aquatic plants, Birds, Neoplasms, Carcinogens, Marine fishes, Fresh water fishes, Dissolved gases, Oxygen, Biodeterioration, Marine microbiology, Toxicology, Fresh water biology, Marine biology, Invertebrates, Shellfish.
Identifiers: *Oil pollution, Oil spills, *Water pollution effects (Plants), *Water pollution effects (Animals).

The bibliography is an updating of FWPCA's 1969 report, PB-188 206 (DAST-19) References on the biological effects of oil include general aspects, specific spill incidents, general effects, carcinogenic effects, microbial utilization, and the effects on birds, fish, shellfish, marine and freshwater invertebrates, plants, and dissolved oxygen. (Author)

PB-213 487/2
National Environmental Research Center, Cincinnati, Ohio. Solid Waste Research Lab.
LANDFILL DECOMPOSITION GASES. AN ANNOTATED BIBLIOGRAPHY,
James A. Geyer. Jun 72, 34p* EPA-SW-72-1-1

Descriptors: (*Earth fills, Gases), (*Waste disposal, Earth fills), (*Bibliographies, Waste disposal), Biodeterioration, Methane, Geology, Water pollution, Fire hazards, Fire safety.
Identifiers: *Soil gases, *Sanitary landfills, *Solid waste disposal.

The bibliography contains 48 articles on a variety of research studies, case studies and observations on gases generated by the decomposition of landfilled refuse. It includes annotations of articles on landfill gas generation and generation rates, gas composition, gas movement rates and travel distances, gas control techniques, and effect upon water quality. (Author)

PB-213 488/0
Union Carbide Corp., Bound Brook, N.J. Chemicals and Plastics.
AN INVESTIGATION OF THE BIODEGRADABILITY OF PACKAGING PLASTICS,
James E. Potts, Robert A. Clendinning, and Watson B. Ackart. Aug 72, 87p* EPA-R2-72-046
Contract CPE-70-124

Descriptors: (*Plastics, *Biodeterioration), (*Packaging materials, Biodeterioration), (*Waste disposal, Plastics), Polyethylene, Polystyrene, Polymeric films, Bags, Molecular structure, Molecular weight, Pyrolysis, Ethylene copolymers, Styrene copolymers, Soil tests, Lactams, Plasticizers, Antioxidants, Absorbers (Materials).
Identifiers: *Solid waste disposal, Plastic bags, Pyrolysis incineration, Polymer additives.

The study investigates the effects of various structural parameters on the biodegradability of plastics. It includes a determination of the effect of molecular weight and polymer end group composition on the biodegradability of polyethylene and polystyrene, and an evaluation of the biodegradability of various block, graft and random copolymers containing polyethylene or polystyrene chain segments. Also included is a study of the biodegradability of organic chemicals used commercially as additives to plastics. The study verifies the popular belief that the current high volume, high molecular weight packaging plastics are not biodegradable at practical rates. The report also establishes that the structural modification of polyethylene and polystyrene by random copolymerization with other monomers will not lead to biodegradability. (Author)

PB-213 492/2
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
AN ACCOUNTING SYSTEM FOR SOLID WASTE MANAGEMENT IN SMALL COMMUNITIES,
Eric R. Zausner. 1971, 21p EPA-SW-28ts
Library of Congress Catalog Card no. 78-611564.
Paper copy available from GPO $0.30 as stock no. 5502-0021, EP3.2:AC2.

Descriptors: (*Waste disposal, *Accounting), Cost analysis, Management planning, Benefit cost analysis, Collecting methods, Data acquisition, Information systems, Urban planning, Communities, Forms (Paper).
Identifiers: *Solid waste disposal, Management information systems.

The increasing costs and complexities of solid waste collection and disposal require new, more sophisticated management techniques. Although cost accounting represents only one part of the total information system, its design, installation, and utilization can represent a significant step in the development of effective solid waste management. The proposed system provides a guide to the type and quantity of information to be collected, its classification, and the method of collection. The system described is designed primarily for small communities (<25,000) that collect and dispose of the solid wastes generated in their jurisdiction. The system was specifically designed to be effective for packer-truck collection and landfill disposal operations.

PB-213 498/9
Mitre Corp., McLean, Va.
ANALYSIS OF FINAL STATE IMPLEMENTATION PLANS: RULES AND REGULATIONS,
L. J. Duncan. Jul 72, 86p* APTD-1334
Contract EPA-68-02-0248

Descriptors: (*Air pollution, *Regulations), (*Government policies, Air pollution), State government, Combustion, Incinerators, Industrial plants, Sulfuric acid, Chemical industry, Metal industry, Paper industry, Fuel storage, Particles, Sulfur dioxide, Nitrogen oxides, Tables (Data), Concrete plants, Coal preparation, Carbon monoxide, Hydrocarbons.
Identifiers: *Implementation Air Pollution Planning Program, Sulfuric acid plants, Nitric acid plants, Fertilizer industry.

The document summarizes the rules and regulations found in State Implementation Plans (SIP) submitted in response to the 1970 Clean Air Act.

Final SIP's were submitted by all 50 states, the District of Columbia, Puerto Rico, American Samoa, Guam, and the Virgin Islands. Whenever both state regulations were extracted and put in the summary table, with footnotes indicating the local regulations. The regulations cover particulate and gaseous emissions. The particulate emission regulations refer to: Fuel burning; Incineration; General process sources; Visible emissions, and Sulfuric acid plants. The following gaseous emissions are covered: Fuel burning (SO2); Fuel burning (NOx); Non-ferrous metals (SO2); Kraft pulp (SO); Sulfuric acid plants (SO2); Sulfur recovery plants (sulfur); Nitric acid plants (NO2); All sources (hydrocarbons); Petroleum storage; All sources (CO). (Author)

PB-213 511/0
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Management Office.
A STATE-OF-THE-ART REPORT ON SYSTEMS INCORPORATING HIGHWAY TRANSPORTATION.
Final rept.,
Tobias A. Hegdahl. 1972, 170p* EPA-SW-99-72

Descriptors: (*Waste disposal, *Collecting methods), (*Cargo transportation, Waste disposal), Reviews, Highway transportation, Bibliographies, Materials handling, Transferring, Cost estimates, Economic analysis, Operating costs, Trucks, Site surveys, Design, Industrial plants, Capital costs, Labor estimates, Gravity conveyors, Compacting, Hydraulic equipment.
Identifiers: *Solid waste disposal, Solid waste storage.

Presented is a state-of-the-art report on highway transportation systems for solid waste. It traces their historical development in the United States, economic justification for their use, basic design and location considerations, and basic cost criteria for constructing, owning, and operating. The report deals only with truck-to-truck transfer systems-- i.e., from route-collection vehicles to large-capacity transfer vehicles. Basically, two categories of these transfer systems are discussed: direct-dump and compaction. An extensive bibliography and specific appendixes are included. (Author)

PB-213 534/2
Saint Louis City/Union Electric Co., Mo.
ENERGY RECOVERY FROM WASTE. A MUNICIPAL-UTILITY JOINT VENTURE.

1972, 20p EPA-SW-36d.i
Grant G06-EC-00312
Prepared in cooperation with Horner and Shifrin, Inc.
Paper copy available from GPO $0.40 as EP1.17:36D1.

Descriptors: (*Waste disposal, *Heat recovery), (*Combustion, Waste disposal), (*Electric power generation, Waste disposal), Refuse disposal, Boilers, Electric power plants, Fuels, Mixtures, Materials handling, Cost estimates.
Identifiers: *Solid waste disposal.

The report discusses the recovery of thermal energy by burning shredded residential solid waste as supplementary fuel in boiler furnaces. Briefly discussed are the process details, the processing facilities, the receiving and firing facilities, the test boiler, and the economics and applicability.

PB-213 537/5
Metropolitan Sanitary District of Greater Chicago, Ill.
AGRICULTURAL BENEFITS AND ENVIRONMENTAL CHANGES RESULTING FROM THE USE OF DIGESTED SEWAGE SLUDGE ON FIELD CROPS.
Interim rept.,
T. D. Hinesly, O. C. Braids, and J. E. Molina.
1971, 73p
Grant G06-EC-00080
Prepared in cooperation with Illinois Univ., Urbana.
Paper copy available from GPO $0.65 as EP3.2:AG8.

Descriptors: (*Sludge disposal, *Irrigation), (*Fertilizing, Sludge disposal), Plant growth, Performance evaluation, Lysimeters, Farm crops, Trace elements, Soil chemistry, Nutrients.
Identifiers: *Sewage irrigation, Liquid waste disposal.

The project studied involved the possible agricultural benefits and environmental changes that would result from applying digested sewage sludge liquid to field crops. In addition, criteria are developed that can be used in selecting sites for this method of sludge disposal. The report discusses the progress made after three year's work. Since agronomic field studies require a minimum of three years to integrate seasonal effects with measured parameters, the longer the duration of a field study, the greater the confidence level of the results. Therefore, only one year of data--detailed climatic measurements, runoff and drain water analyses, and sludge applications--were collected from a lysimeter facility.

PB-213 547/4
Clemson Univ., S.C. Div. of Interdisciplinary Studies.
DESIGN OF A WATER-DISPOSABLE GLASS PACKAGING CONTAINER. PART I: PROTECTIVE OXIDE COATINGS FOR GLASSES BY CHEMICAL VAPOR DEPOSITION. PART II: MECHANICAL PROPERTIES OF WATER-SOLUBLE SODIUM SILICATE GLASSES. PAR T III: THE RATE OF DISSOLUTION OF SODIUM SILICATE GLASSES IN AQUEOUS SOLUTIONS.
Interim rept.,
Samuel F. Hulbert, C. Clifford Fain, and Michael J. Eitel. 1971, 223p EPA-SW-11RG
Grant G06-EC-00033
Paper copy available from GPO $1.75 as stock no. 5502-0046.

Descriptors: (*Bottles, *Waste disposal), (*Glass, *Dissolving), (*Vapor deposition, *Oxide coatings), (*Sodium silicates, Dissolving), Containers, Silicon dioxide, Titanium dioxide, Pyrolysis, Protective coatings, Reaction kinetics, Bend tests, Mechanical properties, Solubility, Optical properties.
Identifiers: *Chemical vapor deposition, *Solid waste disposal, Disposable containers.

The report discusses the development of a water-soluble glass container which has high potential for reducing the container solid waste problem. The report is divided into three parts. In the first a method of coating water soluble silicate glasses with oxide films by chemical vapor depositon was studied. Coatings of silica, titania, and other oxides were readily obtained by pyrolytic decomposition of organic ester vapors. The coating techniques are described. In the next section, a method for mechanically testing sodium silicate glass by the bending test is presented. Finally, the reate of reaction of soluble silicate glasses with aqueous solutions was studied. The apparati used in studying the rate of reaction is described.

PB-213 557/3
New York State Dept. of Health, Albany.
NEW YORK SOLID WASTE MANAGEMENT PLAN.
Status rept. for 1970.

1971, 343P
Prepared in cooperation with Weston (Roy F.), Inc., West Chester, Pa.
Paper copy available from GPO $4.75 as stock no. 5502-0045, EP3.2:N42Y.

Descriptors: (*New York, *Waste disposal), (*Regional planning, Waste disposal), Management planning, Law enforcement, State government, Government policies, Data acquisition, Public relations, Demography, Land use zoning, Trends, Industrial wastes, Agricultural wastes, Transportation, Topography, Legislation, Laws (Jurisprudence), Collecting methods, Mine wastes, Site surveys.
Identifiers: *Solid waste disposal.

The present document publishes the first phase of the New York State solid waste management planning program. The report identifies the overall solid waste problem and establishes a framework for State action to ensure efficient and effective management practices. The report presents and analyzes pertinent solid waste data, identifies problems indicated by the data, sets objectives that if achieved would solve identified problems, and finally, proposes immediate, intermediate, and long-range measures for achieving objectives.

PB-213 576/3
California Univ., Berkeley. Sanitary Engineering Research Lab.
COMPREHENSIVE STUDIES OF SOLID WASTE MANAGEMENT.
Annual rept. no. 3.

1971, 210P
Grant G06-EC-00260
Paper copy available from GPO $1.75 as stock no. 5502-0023.

Descriptors: (*Waste disposal, *Reviews), (*Anaerobic processes, Waste disposal), (*Biodeterioration, Waste disposal), (*Incinerators, Waste disposal), (*Regional planning, Waste disposal), Economic analysis, Management planning, Operations research, Digestion (Decomposition), Agricultural wastes, Newsprint, Wood wastes, Enzymes, Combustion, Cost analysis, California, Engineering drawings.
Identifiers: *Pyrolysis incineration, Manure, *Solid waste disposal, Wet oxidation.

The present report represents the continuation of the first major effort to examine the solid waste problem from the standpoint of systems analysis. An overall solid waste generation and evaluation model was developed, demonstrating interrelationships between land use, technology, economics, population, and other system elements. Practical implications were drawn from this model, as they relate to planning, public health, and application of technology. The following topics are discussed: Planning and economics; Operations research in solid wastes; Anaerobic digestion; Biological fractionation of solid wastes; Incineration -- pyrolysis-combustion; Wet oxidation of organic solid waste materials.

PB-213 577/1
Institute of Scrap Iron and Steel, Inc., Washington, D.C.
IDENTIFICATION OF OPPORTUNITIES FOR INCREASED RECYCLING OF FERROUS SOLID WASTE.
Final rept.,
W. J. Regan, R. W. James, and T. J. McLoer. 1972, 409p* EPA-SW-45D-72
Grant G06-EC-00298

Descriptors: (*Metal scrap, Utilization), (*Iron alloys, Metal scrap), (*Iron and steel industry, Metal scrap), Sources, Marketing, Materials recovery, Economic analysis, Circulation, Cargo transportation, Steel making, Containers, Automobiles, Waste disposal.
Identifiers: *Secondary materials industry, *Metal recycling, Solid waste disposal, Junk car disposal, Household appliances.

The study is an in-depth look at the recycling of ferrous solid waste. The study examines: the sources, types, and quantities of iron and steel scrap; the markets for iron and steel scrap; the functions of the ferrous scrap processing industry;

and the technology of iron and steel scrap utilization. Problems inhibiting greater use of iron and steel scrap are identified and discussed, and recommendations are made for solutions to these problems. A survey of the ferrous scrap industry was the basis for many of the identified problems and proposed solutions, and also provided numerous statistics on the ferrous scrap industry. (Author)

PB-213 596/1
Environmental Protection Agency, Washington, D.C.
HIGH-PRESSURE COMPACTION AND BALING OF SOLID WASTE.
Final rept.,
Karl W. Wolf, and Christine H. Sosnovsky. 1972, 179p* EPA-SW-32D
Grant DO1-UI-00170
Paper copy also available from GPO $1.75 as stock no. EP1.17:32D.

Descriptors: (*Waste disposal, *Compacting), (*Bailing, Waste disposal), (*High pressure compressors, Waste disposal), Performance evaluation, Bales, Materials handling, Tests, Refuse disposal, Garbage disposal, Papers, Stability, Rail transportation, Cargo transportation.
Identifiers: *Solid waste disposal.

The report documents some initial experiments in this country on the high-pressure compaction of municipally collected solid wastes. The application of high-pressure compaction has been examined experimentally and theoretically in quite some detail and appears to be a process which can be applied on a production scale with many attendant advantages. It has been demonstrated that stable bales can be produced by the high-pressure (2000 to 3500 psi applied pressure) compaction of loose and sacked household refuse; and that these bales can successfully survive the handling and shocks associated with comparatively long (up to 700 miles) rail-haul trips.

PB-213 638/7
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
EFFECTS OF FUEL ADDITIVES ON AIR POLLUTANT EMISSIONS FROM DISTILLATE-OIL-FIRED FURNACES,
G. B. Martin, D. W. Pershing, and E. E. Berkau.
Jun 71, 82p* AP-87
Paper copy available from GPO $0.50 as stock no. 5503-0021.

Descriptors: (*Air pollution, Combustion products), (*Fuel additives, *Combustion products), (*Fuel oil, Fuel additives), (*Furnaces, Air pollution), Reviews, Distillates, Particles, Nitrogen oxides, Oil burners, Tests, Sulfur dioxide, Carbon monoxide, Hydrocarbons, Sulfur trioxide, Gas analysis.
Identifiers: *Air pollution control.

The available literature was surveyed, and samples of all known additives procured. Each additive was analyzed for elemental composition to provide a basis for testing. A standard screening procedure was established to test the effect of each additive on emissions from fuel oil combustion. Screening tests were carried out on all distillate soluble additives. The most promising additives were then subjected to a rigorous examination. Fuel additives are not a promising way of reducing air pollution from distillate oil combustion. A majority of the additives tested had no beneficial effects on air pollutant emissions; in fact, some additives even increased total particulate and NO (x) emissions. Several of the metal-containing additives, e.g., Ferrocene, CI-2, and Puelco SO3, reduced total particulate emissions; however, the unknown toxicity of new emissions they create makes their use questionable. Further, there is evidence that for distillate oils, burner modifications are a more suitable route to air pollution control. (Author)

PB-213 639/8
West Virginia Univ., Morgantown. Coal Research Bureau.
PILOT SCALE UP OF PROCESSES TO DEMONSTRATE UTILIZATION OF PULVERIZED COAL FLYASH MODIFIED BY THE ADDITION OF LIMESTONE-DOLOMITE SULFUR DIOXIDE REMOVAL ADDITIVES.
Final rept.

Oct 71, 109p* EPA-R2-72-027
Contract CPA-70-66

Descriptors: (*Waste disposal, Fly ash), (*Fly ash, Utilization), (*Cements, Fly ash), (*Mineral wool, Fly ash), (*Fertilizers, Fly ash), Sources, Air pollution, Inorganic manmade fibers, Soil stabilization, Bricks, Flotation, Calcium silicates, Construction materials, Soil cement, Heat treatment, Neutralizing, Stabilizers (Agents), Trace elements, Combustion products, Byproducts.
Identifiers: *Solid waste disposal, *Air pollution control, *Waste gas recovery, Limestone injection.

Bench-scale experiments to examine methods for potential use of modified flyash indicate that this ash, the solid by-product resulting from the limestone/dolomite process for fixing gaseous sulfur oxides as solid sulfates, can be considered a suitable raw material for a number of new products and processes. The most promising methods of utilization incorporating the total use of modified flyash are the production of calcium-silicate and cement-like structural products, high temperature production of materials such as mineral wool insulation, and the use of modified flyash as a soil stabilizer and amendment. Other use areas were examined and are mentioned; also, several process problems and limitations are discussed. (Author)

PB-213 646/3
Kinney (A. M.), Inc., Cincinnati, Ohio.
SOLID WASTE AND FIBER RECOVERY DEMONSTRATION PLANT FOR THE CITY OF FRANKLIN, OHIO.
Interim rept.,
N. Thomas Neff. 1972, 90p* EPA-SW-47D.1-72
Grant G06-EC-00194

Descriptors: (*Waste disposal, *Materials recovery), Iron, Paper, History, Industrial plants, Industrial engineering, Cost estimates, Operating costs, Capital costs, Comminution, Wet mills, Cyclone separators, Magnetic separators, Incinerators, Fluidized bed processing, Sludge disposal, Metal scrap, Ohio.
Identifiers: *Solid waste disposal, Franklin (Ohio), *Metal recycling, *Paper recycling.

The Franklin, Ohio, resource recovery demonstration project has elicited widespread interest, so the report was prepared to present a preliminary analysis of the solid waste disposal and fiber recovery portions of the project and to provide preliminary data by which others may be guided in evaluating emerging solid waste disposal and resource recovery technologies. The historical development of the project and a general description and evaluation of the process used are included. The preliminary plant economics presented are based on construction costs and the first six months of operation. The plant is now in regular operation recovering ferrous metals and paper fibers which are sold to local industries.

PB-213 657/0
Environmetrics, Inc., Washington, D.C.
THE RIVER BASIN MODEL: THE SOCIAL SCIENCE LABORATORY.
Water pollution control research series.

Dec 71, 277p W73-02853
Contract EPA-14-12-959
Paper copy available from GPO $2.00 as EPI.16.16110FRU12/71-13.

Descriptors: (*River basins, Mathematical models), (*Social sciences, Education), (*Education, *Environmental engineering), Regional planning, Computer programming, Economic factors, Sociometrics, Government policies, Water resources, Laboratories.
Identifiers: *River Basin model.

The RIVER BASIN MODEL delineates an entire regional system and its interaction with water one of its subsystems. Presented is a gaming-simulation, City Model, designed to provide college-level social science students with an educational technique which reverts to a more personalized education (computer assisted laboratory) and at the same time allows society to remain undisturbed by the learning process. In the model, participants are decision-makers in one of three sectors: economic, social or governmental. A starting scenario briefly describes problems, issues, growth characteristics, housing, schools, etc. in the simulated metropolitan area. The computer records participant decisions for each round and regularly provides printouts showing the interaction of decisions and their influence during the run. (Author)

PB-213 680/6
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Management Office.
SATELLITE VEHICLE WASTE COLLECTION SYSTEMS,
James E. Delaney. 1972, 18p* EPA-SW-82ts-1
Summary of report dated 1971, PB-197 931.
Paper copy available from GPO $0.20 as EPI.17:82TS.1.

Descriptors: (*Refuse disposal, *Trucks), (*Urban planning, *Waste disposal), Collecting methods, Garbage disposal, Cost estimates, Labor estimates, Operating costs, Cost comparison, Depreciation, Indirect costs, Productivity.
Identifiers: *Solid waste disposal.

The report summarizes the findings derived from an in-depth study (PB-197 931) of a comparatively new technique being used to collect residential solid wastes. The system's operational details are presented and compared to more conventional methods. The relative efficiencies achieved by private and municipal operators are also outlined. The method involves the use of small, 3- or 4-wheeled vehicles that shuttle between dwelling unit storage points and a packer truck, which later takes the waste to a disposal site. The vehicles reportedly produce the best results in low- to medium-density housing areas where single-family homes predominate.

PB-213 681/5
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
ENVIRONMENTAL PROTECTION AGENCY (EPA) RESEARCH AND DEVELOPMENT ACTIVITIES WITH OXYGEN AERATION,
John B. Stamberg. 2 Mar 72, 45p
Proceedings of Technology Transfer Design Seminar for Municipal Wastewater Treatment Facilities, New York, 29 Feb-2 Mar 72.

Descriptors: (*Activated sludge process, *Oxygenation), (*Sewage treatment, Oxygenation), Oxygen, Process variables, Field tests, Clarification, Settling, Performance evaluation.

The author discusses the results of testing an activated sludge process using pure oxygen aeration. Described are the results from New York City's Batavia plant and Washington, D.C.'s Blue Plains plant. The operating variables are presented along with the effects that oxygenation has on clarification.

PB-213 682/4
Environmental Protection Agency, Washington, D.C. Water Quality Office.

NEW TECHNOLOGY FOR WATER POLLUTION CONTROL,
David G. Stephan, and John J. Convery. May 71, 32p

Descriptors: (*Water pollution, Reviews), Sewage treatment, Industrial waste treatment, Agricultural wastes, Oils, Mine waters, Surface water runoff.
Identifiers: Water pollution control, Oil pollution control, Mine acid drainage, Technology transfer.

The authors review, in a very general manner, the large number of water pollution control techniques available for various pollution sources. They are concerned with the transfer of technology within and outside of the water pollution field. The discussion includes sewage treatment, industrial waste treatment, agricultural waste treatment, urban runoff water treatment, oil pollution prevention, and mining waste control.

PB-213 683/3
International Joint Commission-United States and Canada.
THE NIAGARA RIVER POLLUTION ABATEMENT PROGRESS - 1971.
Summary rept. 1967-1971.

Aug 71, 65p

Descriptors: (*Niagara River, *Water pollution), (*New York, Water pollution), (*Canada, Water pollution), Water quality, Regional planning, Industrial wastes, Sewage, International relations, Trends.
Identifiers: Ontario (Canada), Water pollution abatement, Sewage treatment effluents.

The report reviews the progress of water pollution abatement and water quality improvement in the Niagara River region by New York State and the Province of Ontario. The topics include: General characteristics of the river area; Objectives; Pollution problems; Programs in effect to abate pollution; Municipal and industrial pollution abatement status; and, The expected improvement in Niagara River water quality.

PB-213 684/2
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
CONTROL OF NITROGEN IN WASTEWATER TREATMENT,
S. A. Hannah. 1971, 11p
Presented at the Technology Transfer Seminar, Atlanta, Georgia, 27-29 Oct 71.

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Chemical removal (Sewage treatment), *Nitrogen inorganic compounds), (*Industrial waste treatment, Nitrogen inorganic compounds), Reviews, Inorganic nitrates, Ammonia, Ammonium compounds, Cost estimates.

The author reviews the methods available to remove nitrogen during sewage or industrial treatment. The costs and performance of the various techniques are briefly examined.

PB-213 689/7
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
CONTROL OF ENVIRONMENTAL HAZARDS IN WATER,
Jesse M. Cohen. 7 Jun 71, 26p
Proceedings of Symposia on Environmental Hazards ACS Central Regional Meeting (3rd), Cincinnati, Ohio, 7/8 Jun 71.

Descriptors: (*Hazardous materials, *Chemical removal (Sewage treatment)), (*Sewage treatment, Chemical removal (Sewage treatment)), Carcinogens, Aromatic polycyclic hydrocarbons, Metals, Pesticides, Viruses, Reviews, Precipitation (Chemistry), Alums, Activated carbon treatment, Oxidation, Ozonization, Coagulation, Flocculating.
Identifiers: *Physical chemical treatment.

The report briefly reviews the use of physical-chemical processes to remove metals, carcinogens (Polycyclic hydrocarbons), pesticides, and viruses from waste water.

PB-213 690/4
Robert A. Taft Water Research Center, Cincinnati, Ohio.
NEUTROLOSIS TREATMENT OF ACID MINE DRAINAGE,
Ronald D. Hill, Roger C. Wilmoth, and Robert B. Scott. 1971, 14p EPA-WQO-14010-05/71

Descriptors: (*Mine waters, *Osmosis), (*Neutralizing, Mine waters), (*Water pollution, Mine waters), Sludge disposal, Brines, Performance evaluation, Iron, Membranes, Cellulose acetate, Feasibility, Calcium oxides.
Identifiers: *Mine acid drainage, *Water pollution control, *Reverse osmosis.

The report summarizes recent research on the treating of acid mine drainage. Two processes are combined. Reverse osmosis is used followed by cycling the resulting brine through a neutralization plant. The clarified water from here is then blended into the reverse osmosis feed. The process extracts 98 plus percent of the water and produces a sludge suitable for disposal through landfill.

PB-213 692/2
Robert A. Taft Water Research Center. Cincinnati, Ohio.
THE CASE AGAINST MERCURY,
Robert B. Dean. Feb 72, 13p

Descriptors: (*Mercury, *Pollution), (*Air pollution, Mercury), (*Water pollution, Mercury), Reviews, Public health, Toxicology, Mercury poisoning, Industrial waste treatment, Coal, Combustion.
Identifiers: Water pollution control, Air pollution effects (Animals), Water pollution effects (Animals).

The presentation discusses mercury in the environment. It reviews its toxicity and a few poisoning cases. Primarily it looks at the events and findings which led to the recent enforcement actions to control mercury release.

PB-213 697/7
Metropolitan Sanitary District of Greater Chicago, Ill.
SKI MOUNTAIN: A CONCEPTUAL FEASIBILITY STUDY IN SOLID WASTE MANAGEMENT.
Final rept.

1972, 337P* EPA-SW-46D-72
Grant G06-EC-00163

Descriptors: (*Waste disposal, Earth fills), (*Mountains, *Earth fills), (*Urban planning, Waste disposal), (*Skiing, Earth fills), Industrial wastes, Refuse disposal, Sources, Site surveys, Recreational facilities, Illinois, Design, Erosion control, Vegetation, Cargo transportation, Hauling, Materials handling, Cost estimates, Financing.
Identifiers: *Solid waste disposal, *Chicago (Illinois), Cook County (Illinois), *Sanitary landfills.

The report is the result of a study initiated to determine the conceptual feasibility of disposing of solid wastes generated within Cook County, Illinois, by constructing a 1,000-foot-high mountain that would eventually be used for a number of recreational purposes. The site finally selected is, therefore, 33 miles from Chicago's Loop and straddles the boundary between Will and Grundy Counties; it covers 11 square miles. The factors discussed and evaluated include waste generation rates, site selection procedures, design problems (subsurface conditions, structural stability, decomposition products, cover material requirements, etc.), various forms and combinations of transportation, receiving and processing equipment, costs, financing, and administration. (Author)

PB-213 701/1
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
A STATUS REPORT ON THE UTILIZATION OF FREEZING IN DEWATERING OF SLUDGES,
J. B. Farrell. Aug 71, 11p

Descriptors: (*Sludge drying, *Freezing), (*Dewatering, Sludge drying), (*Sewage treatment, Sludge drying), Reviews, Containers, Cost estimates.
Identifiers: Sludge treatment.

Freezing has been found to produce remarkable changes in some aqueous sludges which have greatly improved their dewaterability. The report summarizes past findings and forecasts whether freezing will see substantial commercial application in dewatering of sludge. (Author)

PB-213 704/8
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
SUSPENDED SOLIDS REMOVAL,
James F. Kreissl. 1971, 21p
Presented at the Technical Seminar/Workshop on Advanced Waste Treatment, Chapel Hill, N.C., 9-10 Feb 71.

Descriptors: (*Suspended sediments, *Sewage treatment), (*Sewage filtration, Suspended sediments), Reviews, Sedimentation, Settling, Performance evaluation, Design, Cost estimates.
Identifiers: *Microstraining.

Suspended solids removal is a necessary consideration in all waste treatment operations. Solids which must be removed may be those present in the raw sewage, those added by some form of recycle within the plant, or those created by biological or chemical actions during treatment. Suspended solids, unlike many other pollutants, vary widely in their chemical and physical makeup. Tertiary removal of suspended solids from a waste stream may also accomplish an increase in organic removal necessary to meet effluent standards due to the organic nature of some of the solids. The discussion is limited to only three available tertiary processes which may be used for upgrading the efficiency of existing treatment facilities. These processes are microstraining, high-rate sedimentation, and granular in-depth filtration.

PB-213 705/7
Environmental Protection Agency, Norton, W. Va. Norton Mine Drainage Field Site.
EVALUATION OF SHAVERS FORK MINE SEALS,
Robert B. Scott. Sep 71, 42p* EPA-14010-09/71

Descriptors: (*Abandoned coal mines, *Sealing), (*Seepage, Measurement), (*Seals, Effectiveness), Water pollution, Inorganic acids, Sulfates, Iron inorganic compounds, Masonry, Calcium oxides, Acidity, Periodic variations, Inspection.
Identifiers: Shavers Fork (West Virginia).

At Bowden, West Virginia, a fish kill occurred in a hatchery in the spring of 1966, reportedly from acid mine drainage flushing out of several abandoned underground coal mines. The West Virginia Department of Mines air sealed several small underground mines in the Taylor Run, Red Run, and Fishing Hawk mining areas by constructing cement block-type air and dry seals at the portals. Since November 1967 seasonal samples have been collected at these seals and analyzed. A report is made on the findings.

PB-213 706/6
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
SIMULTANEOUS QUANTITATION OF SALMONELLA SPECIES AND PSEUDOMONAS AERUGINOSA. I. POLLUTED WATERS. II. PERSISTENCE OF PATHOGENS IN SLUDGE TREATED SOILS. III. ANALYSIS OF WASTE TREATMENT SLUDGES FOR SALMONELLA SPECIES A S A SURVEILLANCE TOOL,
Bernard A. Kenner, G. Kenneth Dotson, and James E. Smith. Sep 71, 43p

Descriptors: (*Water pollution, *Bacteria), (*Water analysis, *Salmonella), (*Soil microbiology, Salmonella), (*Sludge, Salmonella), (*Pseudomonas, Water analysis), Residues, Irrigation, Sludge disposal, Disinfection, Cultures (Biology), Public health.
Identifiers: Pathogens, Sewage irrigation, *Water pollution detection.

The report is divided into three sections. In the first a practical sensitive quantitative method for the isolation and enumeration of Salmonellae and pyocyanogenic Ps. aeruginosa from wastewaters, treatment effluents, streams, stormwater runoff, and sludges, in all seasons of the year, is described. Next the persistence of Salmonella species, Pseudomonas aeruginosa, and fecal coliforms in soils treated with various types of municipal sludges is reported. In the last report it is suggested that a more complete and useful surveillance of salmonellosis for large urban areas can be attained by analysis monthly of municipal primary and secondary waste treatment plant sludges.

PB-213 713/7
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
FUNDAMENTAL DESIGN CONCEPTS FOR THE LIME STABILIZATION OF LEBANON RAW SLUDGE,
James E. Smith, Jr., and S. W. Hathaway. 6 Apr 71, 10p

Descriptors: (*Sludge disposal, *Chemical stabilization), (*Sewage treatment, Sludge disposal), Calcium oxides, pH control, Cost estimates, Filtration, Sludge dewatering, Earth fills.
Identifiers: *Sludge treatment.

In a plant scale study at Lebanon, Ohio, the improvement of the treatment and phosphorus removal were undertaken. On the basis on an economic analysis, it was proposed to treat the raw sludge by lime addition to a pH 11.5 This raw sludge was produced by clarification of raw wastewater that has been coagulated with either aluminum sulfate or ferric chloride. The limed sludge was then drained on sand drying beds, and the cake either given to local farmers or placed in a sanitary landfill. This process replaces the need for biological digestion. Two factors, that of a voluminous and dilute sludge, complicates the handling requirements. Cost savings are discussed.

PB-213 718/2
Environmental Protection Agency, Washington, D.C.
THE AUTOMOBILE CYCLE: AN ENVIRONMENTAL AND RESOURCE RECLAMATION PROBLEM.

1972, 120p*
Paper copy also available from GPO $1.25 as EP1.17:80TS.1.

Descriptors: (*Automobiles, *Resources), (*Automotive industry, Metal scrap), (*Metal scrap, Automobiles), Circulation, Economic models, Reclamation, Waste disposal, Management, Decision making, Iron and steel industry, Foundries, Utilization, Economic analysis, Design criteria, Materials recovery, Strategy.
Identifiers: *Metal recycling, *Waste recycling, *Junk car disposal, *Secondary materials industry, Solid waste disposal.

The study presents a comprehensive analysis of the automobile scrap cycle and a scientific evaluation of the tactics and strategies to improve it. The analysis is as follows: A general model of the total cycle is developed to highlight the interrelationships that exist between the major industrial segments; A detailed flow and process chart is developed to define the scope of operations and delineate the currently available technology in each major area; A decision-logic approach is integrated with the flow charts; All the key decisions affecting recycling in each industry segment are noted and the barriers to favorable decisions are enumerated; Some possible tactics for improved recycling are discussed; and A method for selecting the best course of action is dicussed. (Author)

PB-213 719/1
Robert S. Kerr Water Research Center, Ada, Okla. Treatment and Control Research Program.
DENITRIFICATION BY ANAEROBIC FILTERS AND PONDS.
Water Pollution Control research series rept.

Apr 71, 81p EPA-WQO-13030-ELY-04/71-8

Descriptors: (*Tile drains, Water pollution), (*Anaerobic processes, Chemical removal (Water treatment)), (*Subsurface drainage, Water Pollution), (*Water pollution, *Inorganic nitrates), Biodeterioration, Agricultural wastes, Irrigation, Cost estimates, Feasibility, Reduction (Chemistry), Performance evaluation, Water filters, Pilot plants.
Identifiers: *Water pollution control, *Denitrification, Anaerobic lagoons, Denitration.

The removal of nitrogen from tile drainage by means of bacterial reduction was investigated. The major nitrogen form in tile drainage is nitrate (approximately 98 percent). The process required that an organic carbon source be added to the waste to accomplish reduction of the nitrogen. The bacterial process was used in two configurations, anaerobic filters and anaerobic deep ponds. The projected costs for both processes are approximately 90 dollars per million gallons.

PB-213 720/8
Catalytic, Inc., Philadelphia, Pa.
NEUTRADESULFATING TREATMENT PROCESS FOR ACID MINE DRAINAGE.

Dec 71, 116p EPA-WQO-14010-DYH-12/71
Contract EPA-14-12-518
Paper copy available from GPO $1.00 as EP1.16: 14010DYH 12/71.

Descriptors: (*Mine waters, *Ion exchanging), (*Neutralizing, Mine waters), (*Water pollution, Mine waters), Sulfation, Precipitation (Chemistry), Carbonates, Cation exchanging, Sulfates, Barium sulfates, Performance evaluation, Engineering drawings, Iron.
Identifiers: *Mine acid drainage, *Water pollution control.

A process has been developed for treatment and removal of major pollutants in surface streams of Appalachia caused by acid mine drainage. The raw water is neutralized with sodium bicarbonate to precipitate iron and aluminum, followed by cation exchange to remove sulfate. Barium is eluted from the exchange resin and reacts with sulfate in the water to form a precipitate. Barium is recovered from the precipitate and is processed to recharge the exchange resin. The water is further treated to remove hydrogen sulfide by conversion to sulfur as a saleable byproduct. The process minimizes the cost of sludge and waste disposal while offering a product water meeting the highest interstate water quality standards. Treatment costs are given. (Author)

PB-213 721/7
Environmental Protection Agency, Norton, W. Va. Norton Mine Drainage Field Site.
TREATMENT OF FERROUS IRON ACID MINE DRAINAGE BY REVERSE OSMOSIS,
Roger C. Wilmoth, Donald G. Mason, and Mahendra Gupta. 1972, 42p
Presented at the Symposium on Coal Mine Drainage Research (4th), Pittsburgh, Pa., 26 Apr 72. Prepared in cooperation with Rex Chainbelt, Inc., Milwaukee, Wis.

Descriptors: (*Water pollution, Mine waters), (*Osmosis, *Mine waters), Field tests, Fouling, Membranes, Performance evaluation, Comparisons, Ultraviolet radiation, pH, Flux (Rate), Salt water, Iron, Manganese, Oxidation.
Identifiers: *Mine acid drainage, *Reverse osmosis, *Water pollution control, Tubular membranes, Hollow fiber membranes, Spiral wound membranes, Iron bacteria.

In previous research, reverse osmosis treatment of a ferrous iron mine discharge at Mocanaqua, Pennsylvania was studied. Using a tubular system, a loss of 90 percent of the original product flow in 400 hours of operation due to iron fouling was observed. Though sodium hydrosulfide flushes were successful in flux restoration, fouling immediately recurred upon resumption of operation on the ferrous water. To investigate the Mocanaqua fouling phenomena, field studies were undertaken. Reported are the results of the tests and comparisons with a spiral wound and hollow fiber reverse osmosis unit studied at the same time.

PB-213 731/5
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
NITROGEN IN INDUSTRY,
J. B. Farrell. 31 Mar 71, 17p
Proceedings of Symposium on Nitrogen in Soil and Water, Hespeler (Ontario) 30-31 Mar 71.

Descriptors: (*Water pollution, *Nitrogen inorganic compounds), (*Chemical industry, Water pollution), Reviews, Fertilizers, Ammonia, Urea, Inorganic nitrates, Ammonium compounds, Industrial wastes, Agricultural wastes, Plastics industry, Sources, Industrial waste treatment.
Identifiers: Manure, Nitric acid plants, *Water pollution control, Biological industrial waste treatment.

Production of nitrogen-containing chemicals forms an important segment of the chemical industry. Most of these chemicals are used for fertilizers but a significant proportion have different end-uses, for example, as intermediates in chemical processing sequences. The paper briefly examines the extent of water pollution from these two branches of the nitrogen industry. Also, means for removing nitrogen compounds which enter wastewater are reviewed. (Author)

PB-213 733/3
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
ODORS AND AIR POLLUTION: A BIBLIOGRAPHY WITH ABSTRACTS.

Oct 72, 263p* AP-113
Paper copy also available from GPO $3.00 as EP4:9-113.

Descriptors: (*Odors, *Bibliographies), (*Air pollution, Odors), Sources, Odor control, Odor detection, Gas analysis, Public health, Livestock, Plants (Botany), Atmospheric corrosion, Standards, Legislation, Law (Jurisprudence), Regulations, Public opinion, Industrial wastes.
Identifiers: Air pollution effects (Animals), Air pollution effects (Plants), Air pollution effects (Materials), Air pollution standards, Air pollution detection.

The annotated bibliography presents a compilation of abstracts which deal with odors as they relate to air pollution. The abstracts are arranged within the following categories: Emission sources; Control

methods; Measurement methods; Air quality measurements; Atmospheric interaction; Basic science and technology; Effects-human health; Effects-plants and livestock; Effects-materials; Effects-economic; Standards and criteria; Legal and administrative; Social aspects; and General. (Author)

PB-213 747/7
Robert A. Taft Water Research Center, Cincinnati, Ohio.
SINGLE STAGE HIGH PH LIME CLARIFICATION AND CARBON TREATMENT OF MUNICIPAL WASTEWATER,
Roland V. Villers. Oct 71, 13p

Descriptors: (*Sewage treatment, *Clarification), (*Chemical removal (Sewage treatment), *Phosphorus inorganic compounds), (*Activated carbon treatment, Sewage treatment), Calcium oxides, pH control, Performance evaluation, Nutrients, Dissolved organic matter, Cost estimates.
Identifiers: *Physical chemical treatment.

Previous work at the Lebanon Pilot Plant Facility in Ohio has shown that single stage lime clarification at pH 9.5 will remove 90% or more of the phosphorus present in either primary or, secondary effluent but only 70% of the phosphorus present in raw wastewater. Subsequent bench studies indicated that to achieve 90% phosphorus removal from raw wastewater it is necessary to lime to a pH of 11. The report presents the results of the pilot study that followed in which raw wastewater was lime clarified at pH 11 and then granular carbon treated. (Author)

PB-213 749/5
Federal Water Pollution Control Administration, Cincinnati, Ohio. Ohio Basin Region.
LAND SPREADING, A CONSERVING AND NON-POLLUTING METHOD OF DISPOSING OF OILY WASTES,
G. K. Dotson, R. B. Dean, W. B. Cooke, and B. A. Kenner. 1972, 16p
Presented at the International Water Pollution Research Conference (5th), San Francisco, Calif., Jul/Aug 70.

Descriptors: (*Petroleum industry, Waste disposal), (*Waste disposal, Oils), Land use, Industrial wastes, Water pollution, Refineries, Soil microbiology, Biodeterioration, Bacteria, Fungi.
Identifiers: *Oil wastes, *Oil pollution control, *Liquid waste disposal, *Water poilution control.

Disposal of concentrated wastes is a problem of increasing concern. Some of the most complex wastes are those associated with petroleum. Extracting, transporting, refining, and selling of the petroleum porducts are operations with potential for polluting water. Dredging oil sludge from channels and harbors may pollute lakes and streams when the sludge is dumped back into open water. The paper discusses land spreading operations for oily waste disposal by three refineries.

PB-213 750/1
Federal Water Pollution Control Administration, Cincinnati, Ohio. Ohio Basin Region.
HYDROLYSIS OF ACTIVATED SLUDGE,
R. B. Dean, and R. J. Bouthilet. 1972, 13p
Presented at the International Water Pollution Research Conference (5th), San Francisco, Calif., Jul/Aug 70. Prepared in cooperation with Snell (Foster D.), Inc., Florham Park, N.J.

Descriptors: (*Industrial waste treatment, *Food processing), (*Activated sludge process, *Hydrolysis), (*Sludge disposal, *Feeding stuffs), Sulfur dioxide, Dissolving, Byproducts, Filtration, Molasses, Cost estimates, Livestock.
Identifiers: *Meat packing industry, Sludge treatment, *Water pollution control.

Many pollution experts agree that the limiting operation in a modern sewage disposal plant is the disposal of the solids which accumulate as a result of various separation procedures. Of particular concern is the disposition of activated sludge which is the solids residue resulting from aerobic digestion of soluble or non-settleable solids in sewage. The paper describes the results of a research program in which techniques of hydrolysis and solubilization of meat scrap to the solubilization of activated sludge is described using SO2 as the hydrolytic agent.

PB-213 751/0
National Field Investigations Center-Denver, Colo.
REPORT ON POLLUTION AFFECTING SHELLFISH HARVESTING IN GALVESTON BAY, TEXAS.

Mar 71, 298p

Descriptors: (*Galveston Bay, *Water pollution), (*Texas, Water pollution), (*Fisheries, Galveston Bay), Shellfish, Water quality, Concentration (Composition), Regulations, Ecology, Sources, Industrial wastes, Forecasting, Harvesting, Bacteria, Coliform bacteria, Metals, Oysters, Sewage, Law enforcement, Inventories.
Identifiers: Water pollution standards, Sewage treatment effluents, Houston (Texas), Water quality data.

The report summarizes presently available information pertaining to the quality of the Galveston Bay system in Texas; evaluates that information with respect to applicable standards, statutes, regulations, and criteria; and recommends a program which will lead to compliance with established water quality uses. Specific objectives are included, describing existing water quality; identifying sources of pollution; evaluating impact of present waste discharges on water quality and uses; and indicating the effect of projected water related development upon water quality.

PB-213 752/9
National Field Investigations Center-Denver, Colo.
REPORT ON POLLUTION AFFECTING WATER QUALITY OF THE CHEYENNE RIVER SYSTEM, WESTERN SOUTH DAKOTA.

Sep 71, 99p

Descriptors: (*Cheyenne River, *Water pollution), (*South Dakota, Water pollution), Rivers, Mercury, Metals, Water quality, Tailings, Hydrology, Mining, Fresh water fishes, Concentration (Composition), Mining, Mineral deposits, Leaching, Surface water runoff, Arsenic, Benthos, Cyanides, Industrial wastes, Law enforcement, Inventories.
Identifiers: Mine wastes, Homestake Mining Company, Waste quality data.

During the summer of 1970, fish from the Cheyenne River Arm of Oahe Reservoir, and other areas throughout western South Dakota were found to have mercury in their flesh exceeding 0.5 parts per million (ppm). The report presents a follow up study to investigate the effects of natural mercury deposits throughout the Cheyenne River system in western South Dakota; to determine the location and extent of reservoirs of mercury and other toxic materials due to previous mining activity; to document and characterize the discharge of tailings solids and various dissolved toxic pollutants from the Homestake Mining Company Deadwood-Lead mill; and to ascertain the movement and fate of these pollutants in the hydrologic environment, and the effect of these pollutants on the biota.

PB-213 754/7
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
SLUDGE HANDLING AND ULTIMATE DISPOSAL,
James E. Smith, Jr. Mar 71, 17p
Presented at the 3rd. Annual Short Course on Water Quality Control, Combined Treatment of Domestic and Industrial Wastewaters, Amherst, Mass. 24 Mar 71.

Descriptors: (*Sludge disposal, *Reviews), (*Sewage treatment, Sludge disposal), Aerobic processes, Anaerobic processes, Calcium oxides, Heat treatment, Dewatering, Sludge drying, Vacuum filtration, Centrifuging, Fertilizers, Incinerators, Combustion, Cost estimates.
Identifiers: Sludge treatment.

The disposal of sludges from municipal wastewater treatment facilities can account for up to 50 percent of the total treatment cost. The presentation briefly discusses some alternative methods for the stabilization, dewatering, and ultimate disposal of the sludges. Costs are also discussed.

PB-213 759/2
National Field Investigations Center-Denver, Colo.
REPORT ON WATER QUALITY INVESTIGATIONS, NORTH PLATTE RIVER BASIN, TORRINGTON, WYOMING-TO-BAYARD, NEBRASKA.

Apr 72, 64p

Descriptors: (*Water quality, *Nebraska), Rivers, Surveys, Water pollution, Standards, Waste water, Industrial wastes, Sugar beets, Industrial plants, Management, Wyoming, Nebraska.
Identifiers: *North Platte River, Sugar mills.

Water quality investigations were conducted in the North Platte River. A study was made during the 1971-72 sugar beet campaign following four objectives: to determine compliance with water quality standards established for the North Platte River; to determine the effects of waste sources from sugar beet mills on water quality of the North Platte River; to determine if proposed water pollution control measures are adequate to protect the specified water uses of the North Platte River; and to determine if any enforcement actions are necessary. (Author)

PB-213 771/6
Robert S. Kerr Water Research Center, Ada, Okla.
CONTROL OF MERCURY POLLUTION IN SEDIMENTS,
Curtis C. Harlin, Jr. Sep 72, 61p* W73-02632, EPA-R2-72-043
Contract EPA-68-01-0087

Descriptors: (*Water pollution, *Mercury), (*Sediments, Mercury), Water chemistry, Materials recovery, Particle size, Roasting, Leaching, Hydrometallurgy, Waste disposal, Covering, Metal scrap, Iron, Hypochlorites, Mercury organic compounds.
Identifiers: *Water pollution control, Junk car disposal, Mercury/methyl.

Methods are described for controlling pollution from mercury-laden sediment deposits on the bottom of streams and lakes. Five sediment samples containing from 6 ppm to 500 ppm mercury were investigated. A variety of methods for recovering the mercury values from dredged sediments were explored. Density fractionation, particle size fractionation, flotation, roasting and leaching were the methods studied. Roasting and chemical leaching afford the greatest promise for inexpensive removal and recovery of the mercury. The use of an iron overlay in the form of crushed automobile bodies topped with sand could be an inexpensive and effective method of isolating mercury-containing sediments from a water overlayer. An important attraction of using iron as an overlay is its ability to reduce methylmercury ions as well as mercuric ions to elemental mercury. (Author)

PB-213 772/5
National Field Investigations Center-Denver, Colo.
REPORT ON TOTAL ORGANIC CARBON REMOVAL FROM MUNICIPAL AND INDUSTRIAL WASTEWATER,
James L. Hatheway. Mar 71, 28p* TR-1

Descriptors: (*Activated carbon treatment, *Dissolved organic matter), (*Industrial waste treatment, Activated carbon treatment), (*Sewage treatment, Activated carbon treatment), Adsorption, Reviews, Cost estimates, Clarification, Biochemical oxygen demand, Operating costs.
Identifiers: Biological industrial waste treatment, Physical chemical treatment, Secondary sewage treatment.

The paper summarizes the results of studies undertaken to determine methods of removing total organic carbon (TOC) from municipal and industrial wastewaters. The discussion focuses on the physical-chemical process of activated carbon treatment. Granular activated carbon adsorption, when used in conjunction with chemical precipitation and filtration was found to remove 95 percent or greater of TOC, BOD, chemical oxygen demand (COD), total phosphates and suspended solids, and 78 percent of total nitrogen. Examples of plant variables, data, and costs are also given.

PB-213 775/2
National Field Investigations Center-Denver, Colo.
REPORT ON POLLUTION AFFECTING LAS VEGAS WASH, LAKE MEAD AND THE LOWER COLORADO RIVER, NEVADA - ARIZONA - CALIFORNIA.

Dec 71, 62p

Descriptors: (*Lake Mead, *Water pollution), (*Nevada, Water pollution), (*Colorado River, Water pollution), Water quality, Las Vegas Wash, Arizona, California, Standards, Sources, Regulations, Industrial wastes, Sewage, Inventories, Law enforcement.
Identifiers: Sewage treatment effluent, Clark County (Nevada), Water pollution standards, Water quality data.

Various technical investigations have demonstrated that direct and indirect discharges of municipal and industrial wastes to Las Vegas Wash, an interstate tributary of the Colorado River, from sources in Las Vegas Valley, Nevada, are causing pollution of Lake Mead and the Lower Colorado River which is deleterious to the health or welfare of persons living in Arizona, California and Nevada. This pollution also causes violations of Federal-State water quality standards. The report summarizes the technical information documenting the interstate pollution and recommends remedial abatement actions.

PB-213 777/0
Environmental Protection Agency, Cincinnati, Ohio.
COMBINATION LIMESTONE-LIME TREATMENT OF ACID MINE DRAINAGE,
Roger C. Wilmoth, Robert B. Scott, and Ronald D. Hill. 27 Apr 72, 23p*
Presented at the Symposium on Coal Mine Drainage Research, (4th), Pittsburgh, Pa., 27 Apr 72. Prepared in cooperation with Norton Mine Drainage Field Site, W. Va.

Descriptors: (*Mine waters, *Neutralizing), (*Water pollution, Mine waters), Limestone, Calcium oxides, Iron, pH control, Process charting, Sludge, Cost estimates, Field tests.
Identifiers: *Mine acid drainage, *Water pollution control.

The research investigated treatment methods for ferric iron acid mine drainage. One of the most promising techniques studied was combination limestone-lime neutralization. To date, neutralization has been shown to be the most economical treatment method to remove iron, aluminum, and acidity. Lime treatment has received the majority of research attention. However, limestone treatment offers several distinct advantages over lime; namely higher density, lower volume sludges, cheaper raw material costs, easier handling. Conversely, the biggest disadvantages to limestone are its relatively inefficient reaction rate. In an effort to cover a broader spectrum of application, the report discusses the combination of the two processes.

PB-213 778/9
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
THE THREE SLUDGE SYSTEM FOR NITROGEN AND PHOSPHORUS REMOVAL,
M. C. Mulbarger. Apr 72, 59p*
Presented at the Annual Conference of the Water Pollution Control Federation (44th) Held in San Francisco, Calif., Oct 71.

Descriptors: (*Sewage treatment, *Chemical removal (Sewage treatment)), (*Nitrogen inorganic compounds, Chemical removal (Sewage treatment)), (*Phosphorus inorganic compounds, Chemical removal (Sewage treatment)), Nitrification, Activated sludge process, Alums, Nutrients, Precipitation (Chemistry), pH control, Biochemical oxygen demand, Methyl alcohol, Suspended sediments, Process variables, Performance evaluation.
Identifiers: Denitrification, Chemical oxygen demand.

Three sludge (carbon removal, nitrification and denitrification) system with alum addition for phosphorus removal was evaluated. Eight months of performance data from a 0.2 mgd pilot plant, operating with diurnal flow variations over a nominal liquid temperature range of 10 to 20C, are presented. Performance data for the soluble phase (COD, nitrogen and phosphorus), solids phase (solids characterizations and unit solids production values) and miscellaneous considerations (temperature, pH, alkalinity depletion, etc.) are also presented. Split chemical treatment with alum and optimum pH values will result in optimum system performance and the least amount of precipitated inorganic solids. Soluble phosphorus residuals as low as 0.1 mg/l can be easily achieved with an additional inorganic solids production of about 40 to 60 mg/l. (Author)

PB-213 779/8
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
COST AND SUPPLY ANALYSIS FOR ALUM AND METHANOL USED IN WASTEWATER TREATMENT,
Robert Smith, and Walter F. McMichael. Aug 71, 32p*

Descriptors: (*Alums, Production capacity), (*Methyl alcohol, Production capacity), (*Sewage treatment, Supplies), Resources, Demand (Economics), Forecasting, Consumption, Cargo transportation, Raw materials, Bauxite, Phosphate deposits, Natural gas, Cost analysis.

At the end of the 70's, it is hoped to have most sewage plants removing nitrogen and phosphorus. At the present time, alum is used for phosphorus removal and methanol for nitrogen removal. The report looks at the impact this increased usage will have upon the manufacturing capability of alum and methal producers as well as trucking industry.

PB-213 781/4
National Field Investigations Center-Denver, Colo.
REPORT ON EVALUATIONS OF WASTE SOURCES IN THE CALCASIEU RIVER BASIN, LOUISIANA.
Jan 72, 236p

Descriptors: (*Calcasieu River Basin, *Water pollution), (*Louisiana, Water pollution), Industrial wastes, Refineries, Petroleum industry, Regulations, Water quality, Concentration (Composition), Law enforcement, Inventories, Lake Charles, Paper industry, Chemical industry.
Identifiers: Water pollution standards, Water quality data, Petrochemical industry.

In the southwestern corner of Louisiana -- in the Calcasieu River Basin -- is the State's second largest industrialized area. All of these industries are discharging waste waters into the Calcasieu River or its tributaries. The report presents a study to compile an up-to-date inventory of industrial waste sources; Ascertain types of treatment presently provided and the quality and quantity of each industrial waste discharge; Evaluate the individual and collective impacts of wastewater; and Determine abatement proceedings necessary or warranted under applicable local, State and Federal laws.

PB-213 782/3
Midwest Research Inst., Kansas City, Mo.
THE POLLUTION POTENTIAL IN PESTICIDE MANUFACTURING.
Technical studies rept.,
Edward W. Lawless, Rosmarie von Rumker, and Thomas L. Ferguson. Jun 72, 276p* EPA-OWP-TS-00-72-04
Contract EPA-69-01-0142
Pub. as Pesticide Study Series no. 5.

Descriptors: (*Pesticides, *Pollution), (*Chemical industry, Pesticides), (*Air pollution, Pesticides), (*Water pollution, Pesticides), History, Production rate, Plant location, Synthesis (Chemistry), Formulations, Marketing, Hazardous materials, Toxicity, Fire safety, Industrial accidents, Waste disposal, Industrial wastes, Containers, Insecticides, Herbicides, Dust control, Industrial waste treatment, Packaging, Chemical engineering, Mixings, Regulations, DDT, Aldrin, Dieldrin, Chlordan, Malathion.
Identifiers: Liquid waste disposal, Water pollution control, Air pollution control, Toxaphene, Disulfoton, Phorate, Parathion, Methyl parathion, Carbaryl, Temik, D 2-4 herbicide, T 2-4-5 herbicide, Atrazine, Trifluralin, Methane/bromo, Bacillus thuringiensis, Captan.

The study surveys and evaluates the environmental pollution potential associated with the manufacture, formulation, and marketing of pesticides, including such related activities as packaging, transportation and warehousing, i.e., all of the operations up to the point where a pesticide is placed in the hand of the normal consumer. The topics include the following: History; Present production volumes and sites; Modern manufacturing methods; Formulation of pesticides; and Marketing.

PB-213 783/2
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
NUTRIENT REMOVAL FROM WASTEWATER BY PHYSICAL-CHEMICAL PROCESSES,
Jesse M. Cohen. Mar 71, 50p*

Descriptors: (*Sewage treatment, *Chemical removal (Sewage treatment)), (*Nitrogen inorganic compounds, Chemical removal (Sewage treatment)), (*Phosphorus inorganic compounds, Chemical removal (Sewage treatment)), Reviews, Nutrients, Performance evaluation, Cost estimates, Inorganic phosphates, Inorganic nitrates, Precipitation (Chemistry), Cost estimates, Adsorption, Aluminum oxides, Lanthanum, Ion exchanging, pH control, Chlorination, Chemical reactions, Calcium oxides.
Identifiers: Secondary sewage treatment, Tertiary sewage treatment, *Physical chemical treatment, Ammonia stripping.

The paper considers the more promising advanced waste treatment methods which have been

developed, or are being developed, for removal of phosphorus and nitrogen from wastewater. The discussion is restricted to the physical-chemical processes. Only domestic or domestic-industrial wastewaters are considered, although the processes described may be equally applicable to industrial waste discharges. The report is of special interest to those wishing general information the the processes available and the costs involved.

PB-213 796/7
Bureau of Reclamation, Sacramento, Calif. Mid-Pacific Regional Office.
TECHNIQUES TO REDUCE NITROGEN IN DRAINAGE EFFLUENT DURING TRANSPORT.
Water pollution control research series rept.,
John W. Williford, and Doyle R. Cardon. Jun 71, 52p REC-R2-71-10 EPA-WQO-13030-ELY-6/71-10
Report on Bio-Engineering Aspects of Agricultural Drainage, San Joaquin Valley, California.
Paper copy available from GPO $0.60 as EP1.16: 13030-ELY 6/71-10.

Descriptors: (*Surface drainage, *Nutrients), (*Water pollution, *Inorganic nitrates), (*Aquatic plants, Nutrients), Algae, Grasses, California, Agricultural wastes, Anaerobic bacteria, Dissolved gases, Oxygen, Cost estimates, Barley, Temperature, Ponds, San Joaquin Valley.
Identifiers: *Denitrification, *Nutrient removal, *Water pollution control.

Three methods to remove nitrates from the agricultural drainage water from the San Luis Service Area in California were investigated. One method was a theoretical evaluation of nitrate removal by algae during the transport of the drainage water in the San Luis Canal or during storage in the Kesterson Reservoir. The other methods were designed to promote anaerobic bacterial denitrification in a continuous flow of drainage water. One method used barley straw and the other water grass grown in shallow ponds as the carbon energy source. Under optimum conditions both of these last two methods reduced the nitrate -N concentration of the drainage water from a maximum of about 30 mg/l to less than 2 mg/l. The cost of nitrogen removal by the shallow grass plot systems, the most economical and feasible method investigated, was estimated.

PB-213 803/1
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
ECONOMICS OF CONSOLIDATING SEWAGE TREATMENT PLANTS BY MEANS OF INTERCEPTOR SEWERS AND FORCE MAINS,
Robert Smith, and Richard G. Eilers. Apr 71, 116p

Descriptors: (*Sewage treatment, Consolidation), Pipeline transportation, Sewers, Sewage, Force mains, Cost analysis, Benefit cost analysis, Activated sludge process, Decision making.
Identifiers: Sewage treatment plants.

The report looks at the economics of consolidating sewage treatment plants using interceptor sewers and force mains. Charts and tables are given covering the various cost factors involved. These cost studies include comparisons, benefits analysis, financing, breakeven points, and others.

PB-213 804/7
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
TREATMENT OF PRIMARY EFFLUENT BY LIME CLARIFICATION AND GRANULAR CARBON,
R. V. Villiers, E. L. Berg, C. A. Brunner, and A. N. Masse. Feb 71, 28p
Presented at meeting of American Chemical Society, Toronto, Canada, May 1970.

Descriptors: (*Sewage treatment, *Activated carbon treatment), Calcium oxides, Precipitation (Chemistry), Flow charts, Clarification, Cost estimates, Capitalized costs, Operating costs, Performance evaluation, Regeneration (Engineering), Materials recovery, Clarification, Sewage filtration.
Identifiers: Physical chemical treatment.

The report discusses the use of physical-chemical sewage treatment using lime clarification followed by activated carbon treatment.

PB-213 805/6
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
COSTS OF WASTEWATER RENOVATION,
Robert Smith. Nov 71, 25p

Descriptors: (*Sewage treatment, *Water reclamation), Cost estimates, Water supply, Potable water, Industrial water, Irrigation, Operating costs, Capitalized costs, Construction costs, Design criteria.
Identifiers: Tertiary sewage treatment, Waste water reuse, Sewage irrigation, Water rates.

The use of renovated waste water to supplement raw water sources is widely accepted. The report presents 1968 data on the costs involved in sewage treatment to produce an effluent for one of the following uses: Industrial water, Agricultural water; or Potable water.

PB-213 806/5
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
TREATMENT CAPABILITY OF A PHYSICAL--CHEMICAL PACKAGE PLANT,
J. F. Kreissl, and J. M. Cohen. Apr 71, 38p

Descriptors: (*Sewage treatment, *Activated carbon treatment), Coagulation, Adsorption, Clarification, Turbidity, Phosphorous, Chemical removal (Sewage treatment), Disinfection, Ultraviolet radiation, Color, Microorganism control (Sewage), Alums, Iron sulfate, Cost estimates.
Identifiers: Physical chaemical treatment, Chemical oxygen demand.

A short-term study of a commercially-available physical-chemical waste treatment plant is reported. Results indicate that an excellent quality of effluent can be consistently obtained despite wide fluctuations of influent wastewater characteristics. Physical, chemical, and biological parameters were monitored. The short-term data obtained offer some evidence of superior treatment efficiency in terms of COD, color, turbidity, and phosphorus removals when compared to more conventional treatment methods. (Author)

PB-213 818/1
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
DENSITY INDUCED MIXING IN CONFINED AQUIFERS.
Final rept.,
L. W. Gelhar, J. L. Wilson, J. S. Miller, and J. M. Hamrick. Mar 72, 133p* EPA-WQO-16060-ELJ-03/72

Descriptors: (*Ground water recharge, Aquifers), (*Aquifers, Mixing), Artesian water, Water storage, Underground storage, Water quality, Recharge wells, Density (Mass/volume), Water flow, Approximation, Gravity, Mathematical prediction.

Analytical techniques are developed to describe the mixing between two fluids of different density in a confined aquifer, in which one fluid is introduced to the aquifer by well recharge. The immiscible displacement process in both linear and radial flows is analyzed and the effects of longitudinal and lateral dispersion are included using a boundary layer approximation. The theoretical results demonstrate the effect of hydrodynamic dispersion in retarding gravity segregation due to density differences. The theoretical results are compared with observations of aquifer mixing in linear and radial flow laboratory models. During recharge excellent agreement between the theoretical predictions and experimental results is found and the predicted retarding effects of longitudinal dispersion are verified. During withdrawal some systematic differences between the theory and observation are noted. (Author)

PB-213 819/0
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
STATUS OF ADVANCED WASTE TREATMENT,
I. J. Kugelman. May 72, 80p*
Presented at the Long Island Marine Resources Council, Hauppauge, Long Island, N.Y., 10 Jun 71.

Descriptors: (*Sewage treatment, *Reviews), Chemical removal (Sewage treatment), Phosphorus, Nitrogen, Nutrients, Sewage filtration, Clarification, Cost estimates, Operating costs, Calcium oxides, Precipitation (Chemistry), Alums, Activated sludge process, Nitrification, Activated carbon treatment.
Identifiers: *Tertiary sewage treatment, *Physical chemical treatment, Microstraining, Denitrification.

The Advanced Waste Treatment Program of the U.S. Environmental Protection Agency was instituted over a decade ago. The charter of this program was and still is to upgrade the state of the art of wastewater treatment technology. Program impetus was provided by recent upgrading of water quality criteria and the goal of wastewater renovation and reuse. In the report, a general review of the advanced waste treatment program is given with special emphasis on those developments that are ready for fullscale engineering application.

PB-213 820/7
National Environmental Research Center, Cincinnati, Ohio.
INFORMATION RETRIEVAL CAPABILITIES--NATIONAL ENVIRONMENTAL RESEARCH CENTER, CINCINNATI, LIBRARY.
Socioeconomic environmental series,
M. Friedman. Aug 72, 82p* EPA-R2-72-002

Descriptors: (*Pollution, *Information retrieval), National government, Air pollution, Water pollution, Waste disposal, Libraries.
Identifiers: Government agencies, Oil pollution, Solid waste disposal, Information services, National Environmental Reasearch Center.

The library at the National Environmental Research Center, Cincinnati, is the scientific and technical information focal point for the entire Environmental Protection Agency Library system. As such, it provides technical information back-up to all other EPA libraries, in addition to its responsibilities to NERC-Cincinnati. The Cincinnati Library has access to a number of information centers which maintain over 25 scientific and technical computerized data bases, and contains over 2.5 million documents. It is now providing literature searches using a variety of on-line and off-line data base services. The report describes these information services in detail. Most of the services which are discuss and off-lineed are now available for usage.

PB-213 826/1
National Environmental Research Center, Cincinnati, Ohio.
1971 ANNUAL REVIEW OF LITERATURE. WASTE WATER TREATMENT PHYSICAL AND CHEMICAL METHODS,
Jesse M. Cohen, and Irwin J. Kugelman. 1972, 22p*

Descriptors: (*Sewage treatment, *Reviews), Chemical removal (Sewage treatment), Nitrogen, Phosphorus, Calcium oxides, Precipitation (Chemistry), Activated carbon treatment, Adsorption, Coagulation, Flocculating, Sedimentation, Sewage filtration, Demineralizing, Ion exchanging, Osmosis.
Identifiers: *Physical chemical treatment, Reverse osmosis.

The report reviews the 1971 literature on physical-chemical wastewater treatment. The majority of the processes involve limestone clarification and activated carbon treatment. The report is broken down into the following topics: Phosphorus removal; Nitrogen removal; Adsorption; Coagulation, floculation, Sedimentation; Filtration; and Demineralization.

PB-213 827/0
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
WASTEWATER TREATMENT PLANT CONTROL,
Robert Smith. Jul 71, 45p*

Descriptors: (*Sewage treatment, Automatic control), Automatic control equipment, Water flow, Cost estimates, Manpower, Process charting, Activated sludge process, Cost effectiveness, Requirements.
Identifiers: Sewage flow rate, Sewage treatment plants.

The report discusses the use of automatic control in sewage plants. The topics include the following: Control loops for conventional plants; Control loops for advanced wastewater treatment; Variations in plant influent and effluent; Total cost of treatment; Cost and availability of online instrumentation and control equipment; Cost of equipment, structures, and utilities; Manpower; and Current expenditures for meters and controls.

PB-213 830/5
Environmental Protection Agency, Research Triangle, N.C. Office of Air Programs.
AIR QUALITY DATA FOR 1968, FROM THE NATIONAL AIR SURVEILLANCE NETWORKS AND CONTRIBUTING STATE AND LOCAL NETWORKS.

Aug 72, 241p* APTD-0978

Descriptors: (*Air pollution, United States), Tables (Data), Particles, Metals, Carbon monoxide, Nitrogen oxide (NO), Nitrogen dioxide, Sulfur dioxide, Hydrocarbons, Oxidizers, Concentration (Composition), Rural areas, Urban areas, Diurnal variations, Pyrenes, Ammonium compounds, Fluorides, Inorganic nitrates, Sulfates.
Identifiers: *Air quality data, Air pollution sampling, Soiling index, National Air Surveillance Networks, Benzopyrene, Continuous air monitoring projects.

Particulate- and gaseous-pollutant data gathered during 1968 by the cooperating stations of the various National Air Surveillance Networks provide information about air quality in the United States. Data from independent state and local sampling networks that have contributed their results to the National Aerometric Data Bank are included. Data are presented on suspended particulate pollutants, including data on benzene-soluble organic fractions and on metallic and nonmetallic inorganic constituents; on soiling index; and on gaseous pollutants. Data are given separately for urban and nonurban sites. Annual arithmetic or geometric means of 24-hour average concentrations measured by the Hi-Vol Network and the Gas Sampling Network are presented. The minimum detectable concentrations for each of the 16 metals and 4 nonmetallic inorganic ions are listed. The distribution by population of 1968 annual averages for total particulate, nitrogen dioxide, and sulfur dioxide are presented; gaseous pollutant data for the six Continuous Air Monitoring Projects for the period 1964 through 1968 are reported. (Author)

PB-213 834/1
University of Southern California, Los Angeles. Dept. of Medicine.
PHYSIOLOGICAL ADAPTATIONS TO CARBON MONOXIDE LEVELS AND EXERCISE IN NORMAL MEN,
C. R. Collier, J. M. Workman, J. G. Mohler, J. Aaronson, and O. Cabula. Jul 72, 23p* EPA-RI-72-002
EPA-68-02-0334
Report on Environmental Health Effects Research.

Descriptors: (*Humans, Adaptation), (*Air pollution, Carbon monoxide), (*Public health, Air pollution), Exercise (Physiology), Males, Hemoglobins, Blood, Stress (Physiology), Respiration, Toxicity, Oxygen consumption, Hypoxia.
Identifiers: *Carbonylhemoglobin.

Normal, young, non-smoking men were studied at rest and during submaximal exercise with carboxyhemoglobin (COHb) levels of about 1% and after breathing CO to raise the COHb level to 8 to 9%. Arterial and mixed venous blood was sampled. CO caused an increase in minute volume and breathing frequency during exercise but not at rest. CO caused no changes in cardiac output, heart rate, lactate, lactate/pyruvate ratio, tidal volume, CO2 output or 2,3 DPG during rest or exercise. CO caused a decrease in O2 consumption, in arterial-venous O2 content difference and in venous O2 content and venous Po2 during exercise and in the latter two also at rest. Changes in O2 affinity are still being calculated.

PB-213 841/2
Dow Chemical Co., Freeport, Tex. Texas Div.
TREATMENT OF WASTEWATER FROM THE PRODUCTION OF POLYHYDRIC ORGANICS.
Water pollution control research series rept.,
M. A. Zeitoun, and W. F. McIlhenny. Oct 71, 207p
EPA-12020-EEQ-10/71
Paper copy available from GPO $1.75 as EP1.16:12020 EEQ 10/71.

Descriptors: (*Chemical industry, Industrial waste treatment), (*Brines, *Industrial waste treatment), (*Activated sludge process, Brines), Glycols, Solvent extraction, Amines, Activated carbon treatment, Oxidation, Biodeterioration, Pilot plants, Performance evaluation, Design criteria, Cost estimates.
Identifiers: Propane diol/chloro-1-2, *Chlorohydrins, *Water pollution control, Biological industrial waste treatment.

A number of extremely useful and widely produced compounds are produced by the alkaline hydrolysis of chlorohydrins such as ethylene and propylene glycols and glycerin. The brine wastewater resulting from the production of the glycols is characterized by a high salt content (8-10% NaCl), excess alkalinity, and the presence of several organic compounds. Several processes were examined in the laboratory to determine the usefulness for the treatment of the brine wastewater. The processes tried included solvent extraction of the glycol wastewater with secondary or tertiary amines; adsorption of glycols on activated carbon; biological oxidation of propylene glycol wastewater; and an activated sludge process. Only the last was successful. The operational and design parameters determined from a pilot plant operation were used to design an activated sludge plant to treat 6 MGD of wastewater resulting from the production of 1.2 million pounds per day of propylene glycol. Costs are given.

PB-213 846/7
Akron Scientific Labs., Berkeley, Calif.
DEVELOPMENT OF AN INFRARED FLUORESCENT GAS ANALYZER,
E. A. McClatchie. Aug 72, 11p* ARFR-14
EPA-R2-72-121
Contract CPA-70-152

Descriptors: (*Carbon monoxide, *Infrared spectroscopy), (*Gas analysis, Carbon monoxide), Design, Carbon isotopes, Fluorescence, Absorptance, Excitation, Air pollution, Infrared spectrophotometers.
Identifiers: *Nondispersive infrared spectroscopy, *Air pollution detection, Resonance excitation.

A prototype model low level carbon monoxide analyzer was developed using fluorescent cell and negative chopping techniques to achieve a device superior to state of art NDIR (Nondespersive infrared) analyzers in stability and cross-sensitivity to other gaseous species. It is clear that this type of analyzer has that capacity. The prototype analyzer, which is a self-contained unit powered from 115V 60 HZ line, showed an ultimate detectivity to CO of approximately 1 ppm. and no measurable cross sensitivity to any other gaseous species at the level normally found in the ambient atmosphere. The theory and results of the research are summarized.

PB-213 872/4
Woods Hole Oceanographic Institution, Mass.
SUBLETHAL EFFECTS OF CRUDE OIL ON LOBSTER (HOMARUS AMERICANUS) BEHAVIOR.
Technical rept. May 71-Apr 72,
Jelle Atema, and Lauren Stein. Sep 72, 81p*
WHOI-72-74

Descriptors: (*Lobsters, Oils), (*Water pollution, Oils), (*Shellfish, Water pollution), Animal behavior, Feeding habits, Chemoreceptors, Olfactory organs, Hydrocarbons, Lipids, Sea water.
Identifiers: *Oil pollution, *Oil spills, Homarus americanus.

Small quantities of crude oil (0.9 milliliters in 100 liters of seawater) interfere with some specific, possibly chemosensory, behavior of the lobster, Homarus americanus. Timing of their feeding behavior showed that the delay period between noticing food and going after it doubles when oil was added. The results indicate that small quantities of oil mixed into seawater constitute a noxious, bad smell in the lobsters environment depressing his appetite and chemical excitability. Chemical analyses showed that before the addition of oil a great quantity of lipids was present in the test aquaria. When the water was brought in contact with an oil slick, the lipid concentration dropped considerably. The same effect was seen in the alkane and the alkene-aromatic hydrocarbon fractions. The fate of oil in sea water followed the usual degradation pattern.

PB-213 880/4
Environmental Protection Agency, Washington, D.C. Office of Water Programs.
CONTROL OF OIL AND OTHER HAZARDOUS MATERIALS.

Dec 71, 165p*

Descriptors: (*Water pollution, Oils), Reviews, Tanker ships, Accidents, Refineries, Crude oil, Offshore drilling, Toxicology, Aquatic biology, Water analysis, Hazardous materials, Biodeterioration, Aquatic microbiology, Dispersants, Booms (Equipment), Skimmers, Legislation, Regulations, National government, State government.
Identifiers: *Oil effects pollution, Oil spills, Oil pollution control, Oil pollution detection, Oil pollution removal, Water pollution (Animals), Oil retention booms.

The report discusses the problem of oil spills and their control. A review of the following topics is presented: Oil spill problem (from refineries, tankers, offshore drilling); Oil characteristics (chemical, physical, analysis, sampling, biodeterioration); Oil spill prevention, control, and treatment; and Legal response (legislation, national and regional contingency plans).

PB-213 880/8
Environmental Protection Agency, Washington, D.C. Office of Water Programs.
CONTROL OF OIL AND OTHER HAZARDOUS MATERIALS.

Dec 71, 165p*

Descriptors: (*Water pollution, Oils), Reviews, Tanker ships, Accidents, Refineries, Crude oil, Offshore drilling, Toxicology, Aquatic biology, Water analysis, Hazardous materials, Biodeterioration, Aquatic microbiology, Dispersants, Booms (Equipment), Skimmers, Legislation, Regulations, National government, State government.
Identifiers: *Oil pollution, Oil spills, Oil pollution control, Oil pollution detection, Oil pollution removal, Water pollution effects (Animals), Oil retention booms.

The report discusses the problem of oil spills and their control. A review of the following topics is presented: Oil spill problem (from refineries, tankers, offshore drilling); Oil characteristics (chemical, physical, analysis, sampling, biodeterioration); Oil spill prevention, control, and treatment; and Legal response (legislation, national and regional contingency plans).

PB-213 884/0
National Environmental Research Center, Cincinnati, Ohio. Analytical Quality Control Lab.
HANDBOOK FOR ANALYTICAL QUALITY CONTROL IN WATER AND WASTEWATER LABORATORIES,
D. G. Ballinger, R. L. Booth, M. R. Midgett, R. C. Kroner, and J. F. Kopp. Jun 72, 106p*

Descriptors: (*Water analysis, Quality control), (*Chemical laboratories, Water analysis), Accuracy, Distilled water, Purity, Laboratory equipment, Glassware, Solvents, Data processing, Trace elements, Errors, Personnel development, Decision making, Management planning, Services, Water pollution.
Identifiers: Water pollution detection.

One of the fundamental responsibilities of management is the establishment of a continuing program to insure the reliability and validity of analytical laboratory and field data gathered in water treatment and wastewater pollution control activities. This handbook is addressed to laboratory directors, leaders of field investigations, and other personnel who bear responsibility for water and wastewater data. Subject matter of the handbook is concerned primarily with quality control for chemical and physical tests and measurements. Sufficient information is offered to allow the reader to inaugurate, or to reinforce, a program of analytical quality control which will emphasize early recognition, prevention and correction of factors leading to breakdowns in the validity of data. (Author)

PB-213 887/7
Ohio State Univ. Research Foundation, Columbus.
PYRITIC SYSTEMS: A MATHEMATICAL MODEL.,
Arthur H. Morth, Edwin E. Smith, and Kenesaw S. Shumate. Nov 72, 169p EPA-R2-72-002, W73-03506
Contract EPA-14-12-589
Paper copy available from GPO $2.25 as EPI.23/2:72-002.

Descriptors: (*Mine waters, Mathematical models), (*Water pollution, Mine waters), Computer programs, Pyrite, Oxidation, Spoil, Coal mines, Reaction kinetics, Subsurface drainage, Hydrogeology, Digital simulation.
Identifiers: *Mine acid drainage.

A mathematical model of an acid mine drainage system has been developed for underground mines. The model relates the rate of acid formation to the rate of pollution discharge from the system. The calculational model was developed using a digital computer to simulate an existing mine as the sum of many micro scale mines. The input to the model is a physical and chemical description of the system. Day-to-day simulation requires data on temperature, rainfall, and oxygen concentration at the exposed coal face. The output of the model is estimates of daily acid load and drainage flow. The calculational model was based on a carefully described physical model so that a predictive model can be constructed with little or no experimental data. However, methods for constructing the computational model are given which can use the field data available to increase the reliability.

PB-213 890/2
Robert S. Kerr Water Research Center, Ada, Okla.
DESALINATION OF AGRICULTURAL TILE DRAINAGE.
Water pollution control research series,
Bryan R. Sword. May 71, 40p DWR-174-15, REC-R2-71-12 W73-03501, EPA-WQO-13030-ELY-05/71-12
Report on Bio-Engineering Aspects of Agricultural Drainage, San Joaquin Valley, Calif.
Paper copy available from GPO $1.00 as EPI.16:13030 ELY 05/71-12.

Descriptors: (*Subsurface drainage, *Water treatment), (*Osmosis, Water treatment), (*Electrodialysis, Water treatment), (*Irrigation, *Water reclamation), Demineralizing, Desalting, Nutrients, Nitrogen, Phosphorus, Boron, Tile drains, Cost estimates, Membranes, Performance evaluation.
Identifiers: Reverse osmosis, Dissolved solids, *Water pollution control.

Investigations were made to determine the technical feasibility of desalination of tile drainage. Reverse osmosis (RO) and electrodialysis (ED) processes were studied. Two RO membrane stacks were investigated. The first, a high salt rejection, low product yield, was operated on variable quality (3000-7000 mg/l TDS) irrigation return water. The second RO stack and also the ED unit were operated on return waters that were controlled to have a 3000 mg/l TDS. The second RO stack was designed for a high product rate and low salt rejection. The ED data are based on a single pass through the membrane stack. Costs are reported.

PB-213 891/1
Environmental Protection Agency, San Francisco, Calif. Region IX.
THE EFFECTS OF AGRICULTURAL WASTE WATER TREATMENT ON ALGAL BIOASSAY RESPONSE,
Paul De Falco, Jr., Robert J. Pafford, Jr., and John R. Teerink. Aug 71, 66p DWR-174-12, REC-R2-71-9 W73-03502, EPA-13030-ELY-08/71-9
Report on 'Bio-Engineering Aspects of Agricultural Drainage, San Joaquin Valley, California'.
Paper copy available from GPO $1.00 as EPI.16:13030 ELY 08/71-9.

Descriptors: (*Water pollution, *Nitrogen inorganic compounds), (*Algae, *Nutrients), Agricultural wastes, Subsurface drainage, San Joaquin River, Bioassay, Fluorescence, Tile drains, Plant growth, Aquatic plants.
Identifiers: Nutrient requirements, Denitrification.

Laboratory bioassay experiments were performed to test the effect on algal growth of agricultural waste water before and after the waste water had been subjected to two different nitrogen removal processes. The waste waters were added in various percentages to San Joaquin River Delta water for bioassay. The algal growth throughout time was monitored by chlorophyll fluorescence techniques. The fluorescence measurements showed logarithmic growth similar to the type usually observed in the Delta Water over the vernal growth period. The laboratory experiments gave positive statistical evidence that the untreated agricultural waste water would promote substantial algal growth above that of the San Joaquin River controls. (Author)

PB-213 892/0
Geophysical Survey Systems, Inc., North Billerica, Mass.
FEASIBILITY STUDY OF ELECTROMAGNETIC SUBSURFACE PROFILING,
Rexford M. Morey, and Walter S. Harrington, Jr. Oct 72, 76p EPA-R2-72-082, W73-03509
Contract EPA-68-01-0062
Paper copy available from GPO $1.25 as EPI.23/2:72-082, W73-03509.

Descriptors: (*Electromagnetic prospecting, Feasibility), (*Pipes (Tubes), Detection), Radar equipment, Remote sensing, Subsurface investigations, Geologic investigations, Interfaces, Conductivity, Dielectric properties, Soils, Underground structures, Water pipes, Sewer pipes, Performance, Cost estimates.
Identifiers: *Electromagnetic profiling.

A study was made of a unique radar system which produces a continuous profile of subsurface conditions showing depth and location of geological formations and buried utilities. Information is obtained by sending electromagnetic pulses into the earth and then receiving the reflected pulses from interfaces and objects. The unit travels at 3mph, and can detect interfaces directly below it to depths of 10 feet in clay and 25 feet in sand. Depth of penetration is governed by conductivity and dielectric constant. Water content influences these soil parameters; an increase in water content decreases penetration. The penetrability of the soil determines the maximum depth at which pipes can be detected. A break in the pipe can be detected by the saturated soil around the break. Limits of penetration have not been reached; work is being done to determine empirical standards of system performance on a wide variety of soils. Since better information yields better cost estimates for designing sewage collection systems, the advantages of the radar system are apparent. (WR-SIC Abstract)

PB-213 893/8
National Environmental Research Center, Cincinnati, Ohio.
AN INVESTIGATION OF PHOSPHORUS REMOVAL MECHANISMS IN ACTIVATED SLUDGE SYSTEMS,
W. E. Morgan, and E. Gus Fruh. Nov 72, 155p EPA-R2-72-031 W73-03512
Paper copy available from GPO $2.00 as EPI.23/2:72-031.

Descriptors: (*Activated sludge process, Phosphorus), (*Phosphorus, *Chemical removal (Sewage treatment)), (*Sewage treatment, Chemical removal (Sewage treatment)), Metabolism, Precipitation (Chemistry), Growth, Nutrients, Calcium phosphates, Aeration, Process variables, Microbiology, Microorganism control (Sewage).

The magnitude of two phosphorus removal mechanisms, metabolic uptake and chemical precipitation with calcium, in activated sludge systems were investigated using synthetic substrates representative of actual wastewaters. Using completely mixed continuous flow laboratory activated sludge units with operating conditions

that precluded significant precipitation of phosphorus, normal growth defined as constant 85 to 90 percent carbon removal was studied. An alkaline phosphatase bioassay verified qualitatively the normal growth phosphorus requirement and storage zone, but did not define the upper limit of the saturation zone. Alkalinity was implicated to exert both a kinetic effect as well as an effect on residual soluble phosphorus in calcium-phosphorus systems. The presence of soluble organics also was shown to be inhibiting with increasing concentrations.

PB-213 894/8
National Environmental Research Center, Corvallis, Oreg.
THE ROLE OF SLUDGE WORMS IN EUTROPHICATION,
Ralph O. Brinkhurst. Aug 72, 70p EPA-R3-72-004 W73-03513
Paper copy available from GPO $1.25 as EP1.23:72-004.

Descriptors: (*Limnology, *Worms), (*Nutrients, Limnology), (*Sediments, Limnology), Benthos, Ecology, Feces, Concentration (Composition), Respiration, Growth, Nitrogen, Lake Ontario, Great Lakes.
Identifiers: Cycling nutrients, Eutrophication, Tubifex, Linmodrilus, Peloscolex, Oligochaeta.

Return from the sediment may occur not only by simple chemical exchange, but by the irrigation of sediment by organisms, particularly worms. If sediments are irrigated by worms, the surface may be aerobic but the faeces are derived from the anaerobic layer, so that their deposition on the surface may release nutrients into the water column. To study this, the authors assessed the production of worm tissue in Toronto Harbour and in the trophic gradient of the Bay of Quinte (which strongly resembles the whole Lake Erie system of three basins). The primary aim was to evaluate the recovery of potential nutrients from sediment via the production of sludge worm tissue and the rate of destruction of organic matter in sediment via assimilation by worms (production plus respiration).

PB-213 895/7
Black and Veatch, Kansas City, Mo.
WASTEWATER TREATMENT PLANT COST ESTIMATING PROGRAM,
Richard G. Eilers, and Robert Smith. Apr 71, 60p*
Contract EPA-14-12-462

Descriptors: (*Sewage treatment, Cost estimates), Computer programs, FORTRAN, Capitalized costs, Operating costs, Amortization, Design criteria, Activated sludge process, Trickling filtration, Sedimentation.
Identifiers: Sewage treatment plants, IBM 1130 computers.

The report describes a digital computer program for estimating the capital cost, the amortization cost, and the operating and maintenance cost for conventional wastewater treatment plants made up of subsets of current processes. The design relationships used in the program for sizing the individual processes were made as simple as possible. Engineering relationships were used to compute the quantity of sludge produced, the oxygen requirements, etc. This program can be used to estimate the cost of primary sedimentation plants, activated sludge plants, and trickling filter plants. Cost estimates generated by the program for various sizes of plants are shown in the third section of this report. The program is written in FORTRAN and is designed to run on a 16K IBM 1130 computer.

PB-213 900/0
National Environmental Research Center, Cincinnati, Ohio. Analytical Quality Control Lab.
IDENTIFICATION OF POLYCHLORINATED BIPHENYLS IN THE PRESENCE OF DDT-TYPE COMPOUNDS.
Oct 72, 66p EPA-R2-72-004 W73-03515
Contract EPA-68-01-0082
Paper copy available from GPO $1.25 as EP1.23/2:72-004.

Descriptors: (*Chlorine organic compounds, *Emission spectra), (*Spectroscopic analysis, Chlorine organic compounds), (*Pesticides, Spectroscopic analysis), DDT, Biphenyl, Excitation, Fluorescence, Chlorine aromatic compounds, Chlorine aliphatic compounds, Errors, Molecular isomerism, Water analysis, Cryogenics.
Identifiers: *Biphenyl/chloro, DDD pesticide, DDE pesticide, *Water pollution detection.

Polychlorinated biphenyls (PCB's) interfere with gas chromatographic analyses of DDT and related compounds, necessitating a simple indipendent method for PCB determination. The purpose of the present study was to determine the applicability of low temperature (77K) luminescence methods to this problem. Basic studies included documentation of excitation/emission spectra of 6 pesticides (p, p' - and o,p'- DDE, DDD, and DDT), 7 PCB isomers, and 5 PCB mixtures (Aroclors). Although phosphorescence spectra of the DDD and DDT compounds are very similar, possible differences in lifetime and polarization measurements may aid in differentiation. Low temperature luminescence studies in various binary mixtures of Aroclor 1254 and p, p' -DDT indicate Aroclor 1254 may be identified and quantitated in the presence of DDT concentrations 100X greater.

PB-213 901/9
National Environmental Research Center, Corvallis, Oreg.
CONTROLLING THERMAL POLLUTION IN SMALL STREAMS,
George W. Brown, and Jon R. Brazier. Oct 72, 68p EPA-R2-72-083 W73-03516
Paper copy available from GPO $1.25 as EP1.23/2:72-083.

Descriptors: (*Water pollution, Heat), (*Lumbering, Water pollution), Solar heating, Forestry, Oregon, Temperature.
Identifiers: *Thermal pollution, *Water pollution control, *Clear cutting.

Buffer strips have been proposed as a method for controlling temperature changes in streams adjacent to clear-cuttings. Nine small mountain streams in Oregon's Coast Range and Cascade Mountains were studied to determine the influence of buffer strips on water temperature. Timber volume in the strip, strip width, and canopy density perpendicular to the sun's rays were compared to the effectiveness of the strip in controlling temperature change. This effectiveness was not well correlated with timber volume or strip width. The density of the canopy in the path of the sun is the most important buffer strip characteristic for water temperature control. A method for measuring the density of the canopy in the path of the sun is described. The use of this method in the design of buffer strips will provide protection for the stream and maximum harvesting of the timber resource. (Author)

PB-213 902/7
National Environmental Research Center, Cincinnati, Ohio.
INITIAL MIXING IN COAGULATION PROCESSES,
Richard J. Stenquist, and Warren J. Kaufman.
Nov 72, 167p EPA-R2-72-053 W73-03511
Paper copy available from GPO $2.25 as EP1.23/2:72.053.

Descriptors: (*Coagulation, Mixing), (*Sewage treatment, Coagulation), (*Flocculating, Mixing), Performance evaluation, Turbulent flow, Alums, Tubes, Tracer studies, Electrical resistance, Chlorination, Flow rate, Applications of mathematics, Chemical reactors.
Identifiers: Sewage flow rate.

The investigation was undertaken with the objective ofdetermining the importance of the initial mixing step in water and wastewater treatment processes and determining whether increasing the rapidity of the initial mixing could improve process performance. The principal process considered was alum coagulation-flocculation of a kaolin suspension in water. The initial mixing device under consideration was a biplane, square-mesh grid of bars placed in a turbulent flow, tubular reactor; a 2-in. pipe was used in the present studies. Studies were made using a single electrode 'point' conductivity probe and NaCl solution tracer to determine what parameters affect the mixing which occurs in the turbulaent flow field downstream from a grid, and from these results a general mixing model was developed. The relation between initial mixing and process performance was also studied. (Author)

PB-213 905/3
Eastern Environmental Radiation Lab., Montgomery, Ala.
APPLICATION OF EMULSIONS IN TRITIUM COUNTING WITH REFRIGERATED SYSTEMS,
Robert Lieberman, Benjamin P. Prewitt, and Robert Orth. 28 Jan 71, 7p
Prepared in cooperation with Florida State Dept. of Heath and Rehabilitative Services, Orlando.

Descriptors: (*Emulsions, *Scintillation counters), Tritium, Organic solvents, Xylenes, Toluene, Formulations, Water.

The use of emulsifiers in the low-level radioassay of tritiated aqueous samples by liquid scintillation counting at ambient temperature was investigated and a new emulsifier for this purpose, Triton N-101, was introduced earlier. The objective of the investigation reported here was to find an optimum emulsifier system that would incorporate 40 percent water and remain clear at temperatures below 10C.

PB-213 906/1
Eastern Environmental Radiation Lab., Montgomery, Ala.
FIELD DETERMINATION OF DOSE FROM 133XE IN THE PLUME FROM A PRESSURIZED WATER REACTOR,
G. J. Karches, H. E. Kolde, W. I.. Brinck, R. L. Shearin, and C. R. Phillips. 1971, 10p IAEA-SM-148/30
Pub. in Rapid Methods for Measuring Radioactivity in the Environment, p515-523 1971.

Descriptors: (*Radioactive contaminants, Xenon isotopes), (*Gamma counters, Radioactive contaminants), Pressurized water reactors, Air pollution, Dose rate.
Identifiers: FIDLER detectors, Xenon 133.

A commercially available instrument designed for measuring low-energy gamma radiation has been successfully used to monitor the plume from a pressurized water reactor (PWR). The detector consists of a 1/16-in. thick by 5-in. diameter NaI (Tl) crystal optically coupled through a quartz light pipe to a 5-in. multiplier phototube. Pulses from the detector are sorted by use of a single-channel pulse height analyser and read from a linear-log meter. Response of the instrument is compared with a tissue-equivalent ionization chamber to approximate the external dose to persons in or near the plume. The instrument response at a distance of 0.4 mile was six times the background reading. At distances greater than one mile the plume was still easily detectable. The detector system described is applicable for tracking the plume from RWRs, and can also be used for estimating the dose to the population for both decay tank discharges and accidental releases. (Author)

PB-213 907/9
Eastern Environmental Radiation Lab., Montgomery, Ala.
A RAPID METHOD FOR DETERMINING 85KR IN ENVIRONMENTAL AIR SAMPLES,
S. L. Cummings, R. L. Shearin, and C. R. Porter.
1971, 8p IAEA-SM-148/11
Pub. in Rapid Methods for Measuring Radioactivity in the Environment, p163-169 1971.

Descriptors: (*Air pollution, Krypton 85), (*Gas analysis, *Krypton 85), (*Radioactive contaminants, Air pollution), Gas sampling, Scintillation counters, Concentration composition, Laboratory equipment.
Identifiers: Air pollution detection.

The report describes a rapid method for determining 85Kr in environmental air samples. Equipment and procedure used to separate 85Kr from environmental air samples for liquid scintillation counting are described in detail. The procedure employs charcoal and molecular sieve cold traps, calcium sulphate, ascarite (NaOH preparation) and a titanium furnace (900C) for the removal and separation of other air constituents from krypton. Air samples are spiked with 83Kr (m) to provide a direct determination of the krypton separation yield. One cubic metre of air can be processed in about 4 h with 80 to 90% krypton recovery resulting in a 2-sigma error of the 85Kr concentration of less than 10%. The procedure is well suited to monitoring environmental air samples with respect to nuclear facilities, such as nuclear reactors and fuel reprocessing plants.

PB-213 908/7
Eastern Environmental Radiation Lab., Montgomery, Ala.
STUDY OF THE FEASIBILITY OF MEASURING 85KR THROUGH A NATIONAL SURVEILLANCE SYSTEM,
R. L. Shearin, C. R. Porter, and S. L. Cummings.
1971, 6p IAEA-SM-148/64
Pub. in Rapid Methods for Measuring Radioactivity in the Environment, p649-653 1971.

Descriptors: (*Krypton 85, *Air pollution), (*Nuclear power plants, Radioactive contaminants), (*Radioactive contaminants, Air pollution), United States, Gas sampling, Scintillation counters, Errors.

The report describes the feasibility of determining the rate of increase of 85Kr in environmental air caused by the discharge of the gaseous waste product from nuclear facilities. Compressed air was acquired from commercial suppliers in widely distributed locations throughout the United States. Krypton was separated from the air and counted by liquid scintillation. Comparison was made with previous determinations. Concentration versus time relations are presented to show any increased levels as more nuclear facilities go into operation. The results are analysed to determine if statistically significant differences in levels exist between sampling locations. Variations and concentrations at a given location are also evaluated. Public exposure doses are calculated. Comments are offered relative to the future significance of 85Kr in environmental radiation with projected growth in the nuclear industry. Based on the rbove study, the feasibility of operating a national network is presented, including recommended number of stations, mode of sampling and sampling site selection. (Author)

PB-213 909/1
Eastern Environmental Radiation Lab., Montgomery, Ala.
IN VIVO KINETIC BEHAVIOR OF 85KR IN THE WHOLE GUINEA PIG,
William P. Kirk, and Donald A. Morken. 1972, 22p
Prepared in cooperation with Rochester Univ., N.Y. Presented at the Annual Meeting Health Physics Society, Las Vegas, Nev., 11-15 Jun 72. Paper no. 63.

Descriptors: (*Krypton isotopes, *Radiobiology), In vitro analysis, Physiology, Radiation dosage, Gases, Tissues (Biology), Absorption (Biology), Radiation hazards, Saturation, Body weight, Guinea pigs, Experimental data.
Identifiers: Krypton 85.

Assessment of the total hazard associated with 85Kr exposure must include evaluation of the dose from gas in the body tissues which, in turn, requires detailed knowledge of its in vivo kinetic behavior. Study of kinetic behavior is the evaluation of the capacity of a tissue or aggregate of tissues to hold 85Kr and the rate (s) at which it will reach that capacity during an exposure or, alternately, give up the krypton when the exposure ceases. A common measure of the capacity of the tissue for 85Kr is the partition coefficient which is the ratio of the equilibrium concentration (volumetric) of 85Kr in the tissue to the concentration in the air being breathed. The data reported together with the observations of Tobias et al and Hytten indicate that time required for saturation and desaturation may be directly correlated to weight of the animal.

PB-213 910/8
Environmental Protection Agency, Rockville, Md. Office of Research and Monitoring.
BULLETIN OF COURSES, JANUARY--DECEMBER, 1972.

1972, 30p

Descriptors: (*Radiobiology, *Personnel development), National government, Education, Radioactive contaminants, Public health.

The bulletin describes the short-term radiological health training courses offered in calendar year 1972 by EPA. These courses emphasize environmental aspects of radiation and radioactivity. Some are modifications of previous DHEW-BRH courses while others are new and are being offered for the first time.

PB-213 911/7
Southeastern Radiological Health Lab., Montgomery, Ala.
THE UPTAKE OF CERIUM-144, PROMETHIUM-147, AND PLUTONIUM-238 BY OAT PLANTS FROM SOILS,
S. L. Cummings, and L. Bankert. 14 Jan 71, 3p
Pub. in Radiological Health Data and Reports, v12 p83-85 Feb 71.

Descriptors: (*Radioactive isotopes, Agricultural products), (*Public health, Radioactive isotopes), Farm crops, Oat plants, Soils, Environment, Absorption (Biology), Plants (Botany), Cerium 144, Plutonium 238, Promethium 147, Health physics, Food chains.

The uptakes of cerium-144, promethium-147, and plutonium-238 by oat plants were determined for nine soils, and promethium-147 and plutonium-238 uptakes were compared with cerium-144 uptake. The percentage uptake values for all three radionuclides were very low, ranging from .000,001 to .001 percent. Nitrogen and potassium fertilizers increased the uptake of promethium-147 by oat plants from an Amite soil. Because the amount of cerium-144, promethium-147, and plutonium-238 taken up by plants from soils is very small, the health hazards to man by the soil-plant-man pathway from these radionuclides will probably be negligible at the levels used in this study. (Author)

PB-213 912/6
Southeastern Radiological Health Lab., Montgomery, Ala.
LONG-TERM EVALUATION OF THE BIOLOGICAL HALF-LIFE OF TRITIUM,
A. A. Moghissi, M. W. Carter, and Robert Lieberman. 27 Aug 70, 4p
Revision of report dated 16 Jul 70. Pub. in Health Physics, v21 p57-60 Jul 71.

Descriptors: (*Tritium, Half life), (*Radioactive isotopes, Half life), (*Health physics, Tritium), (*Occupational diseases, Tritium), Absorption (Biology), Skin, Painting, Irradiation, Radiation hazards, Seasonal variations, Body fluids.

The body burdens of two tritium luminous dial painters have been followed since the 'all of 1967. Urine collections began 6-10 months after termination of work involving occupational exposure to tritium. In both cases, an intermediate (Ti) and a long (T1) half-life component could be observed. One individual exhibited a Ti of 21 days and a T1 of 280 days, whereas the second worker showed a Ti of 33 days and a T1 of 2020 days. A surprisingly high seasonal dependence of tritium body water concentration was observed in one case. This resulted in an increase of tritium conceatration in body water in winter as compared to the previous summer. (Author)

PB-213 913/7
Southeastern Radiological Health Lab., Montgomery, Ala.
A GEL FOR LIQUID SCINTILLATION COUNTING BASED ON BITOLYLENE DIISOCYANATE,
R. Lieberman, M. W. Williams, and E. W. Pepper.
8 Dec 70, 2p
Pub. in Health Physics, v21 p326-327 Aug 71.

Descriptors: (*Scintillation counters, *Gels), Isocyanates, Gelation.

An improvement has been made in the methodology for making gels used in liquid scintillation counting. The gel is based on the reaction product between bitolylene diisocyanate Isonate 136-T and Armeen L-11 (branched aliphatic primary amine). The diisocyanate used has moderate reactivity and low vapor pressure. Gelling consistency and time can be varied with the concentration of diisocyanate dissolved in the scintillation solution. (Author)

PB-213 928/8
National Environmental Research Center, Cincinnati, Ohio.
FULL SCALE PARALLEL ACTIVATED SLUDGE PROCESS EVALUATION,
Erwin D. Toerber. Nov 72, 201p EPA-R2-72-065 W73-03510
Paper copy available from GPO $2.75 as EP1.23/2:72-065.

Descriptors: (*Activated sludge process, Performance evaluation), (*Sewage treatment, Activated sludge process), Mixing, Flow rate, Aeration, Solids, Pilot plants, Cost estimates, Tracer studies, Biochemical oxygen demand, Comparisons.
Identifiers: Sewage flow rate.

A comparison was made between parallel activated sludge systems operating under completely-mixed and plug-flow modes. Initially, a rhodamine dye tracer study was conducted to determine conditions necessary to achieve the two operational modes. The completely-mixed system was operated at 5 constant detention times ranging from 5 hours to 1 hour. The break in treatment efficiency (a marked drop below 90% removal of soluble BOD5) occurred between 1 and 2 hours. No marked difference in treatment efficiency was found between the two modes. A set of shock loads were applied in parallel and separately to each mode. The complete-mix system did show an advantage over plug-flow under shock load conditions at a short detention time (1.5 hours). A 500 gpd completely-mixed pilot plant was successful in duplicating the full scale organic removal efficiency.

PB-213 929/7
Robert S. Kerr Water Research Center, Ada, Okla.
CHARACTERISTICS OF RAINFALL RUNOFF FROM A BEEF CATTLE FEEDLOT,
R. Douglas Kreis, Marion R. Scalf, and James F. McNabb. Sep 72, 51p W73-03520, EPA-R2-72-061
Paper copy available from GPO $1.00 as stock no. EP1.23/2:72-061.

Descriptors: (*Water pollution, Agricultural wastes), (*Surface water runoff, *Agricultural wastes), (*Beef cattle, Agricultural wastes), Livestock, Rainfall intensity, Nutrients, Industrial waste treatment, Dissolved organic matter, Biochemical oxygen demand, Concentration (Composition).
Identifiers: *Feedlot wastes, Manure, Chemical oxygen demand, Path of pollutants.

Rainfall runoff from a 12,000-head capacity commercial beef cattle feedlot was characterized and a treatment-disposal system used by the feedlot was evaluated. A four- to ten-inch manure mantle on the feedpen surface was found to prevent runoff from 0.2- to 0.3-inch rainfalls depending on intensity and antecedent moisture conditions. The total runoff from the feedpens was equivalent to 39 percent of the total rainfall during the study period. Direct runoff from the feedpens contained pollutant concentrations in the form of oxygen demand, solids, and nutrients that were generally an order of magnitude greater than concentrations typical of untreated municipal sewage. The treatment disposal system produced no appreciable improvement in the quality of the waste water.

PB-213 930/1
Eastern Environmental Radiation Lab., Montgomery, Ala.
CONTINGENCY RESPONSE FOR RAPID EVALUATION OF RADIOLOGICAL POLLUTION FROM A SPACE VEHICLE LAUNCH ACCIDENT,
R. L. Shearin, and C. R. Phillips. 1971, 12p
IAEA-SM-148/65
Pub. in Rapid Methods for Measuring Radioactivity in the Environment, p757-767 1971.

Descriptors: (*Radiation measuring instruments, *Spacecraft launching), Radiation warning systems, Public health, Safety, Radioactive contaminants.
Identifiers: FIDLER detectors, Apollo, SNAP.

In fulfilling the Environmental Protection Agency's responsibility for providing surveillance and evaluation of environmental pollution, a contingency response capability is provided in support of certain space vehicle launch operations. The plan described provides for the rapid evaluation of environmental elements in the public domain adjacent to space launch facilities. The plan is implemented during the final phase of launch operations of space vehicles carrying SNAP-27 devices which contain a significant quantity of 238Pu. Monitoring equipment includes FIDLER detectors and appropriate equipment to determine airborne and surface contamination.

PB-213 931/9
Eastern Environmental Radiation Lab., Montgomery, Ala.
REVIEW OF TRITIUM MONITORING DEVICES,
H. L. Kelley, and C. R. Phillips. Aug 71, 21p

Descriptors: (*Radiation measuring instruments, *Tritium), Reviews, Ionization chambers, Proportional counters, Scintillation counters, Monitors.

The need for adequate monitoring techniques led to the investigation of many possible monitoring systems. The difficulties associated with the detection of very low energy radiations have necessarily complicated basic detection devices, and individual specifications are, therefore, often necessary for each particular monitoring requirement. Practical monitors can be separated essentially into two groups. One group consists of monitors that render constant or immediate indications of activities within the monitored media. The second includes tritium collection systems that use water vapor collection traps for subsequent analysis of tritium. The report discusses these two types of monitors.

PB-213 932/7
Eastern Environmental Radiation Lab., Montgomery, Ala.
SAMPLING AND ANALYSIS OF SOILS FOR PLUTONIUM,
F. E. Butler, R. Lieberman, A. B. Strong, and U. R. Moss. 22 Jul 71, 13p EERL-A71-18

Descriptors: (*Plutonium, *Soil analysis), Radioactive contaminants, Dissolving, Evaporation, Solvent extraction, Alpha particle detectors.

The paper describes the progress in analysis of soils artificially spiked with plutonium, soils containing particulate plutonium deposited from a processing plant, and soils containing fallout plutonium. The emphasis is on distribution of the actinide determined after both fusion and acid leaching techniques. The extraction technique is presented.

PB-213 938/4
Syracuse Univ., N.Y. Dept. of Chemical Engineering and Materials Science.
BIOLOGICAL TREATMENT OF ACID MINE WATER.
Final rept.,
Franco Rabolini, and Philip A. Rice. Jul 71, 83p
Grant EPA-WP-01460-01

Descriptors: (*Mine waters, *Sulfate reducing bacteria), (*Water pollution, Mine waters), (*Industrial waste treatment, Mine waters), Biodeterioration, Metabolism, Growth, Sludge, Temperature, pH, Digestion (Decomposition), Desulfovibrio.
Identifiers: Sulfur bacteria, *Mine acid drainage, Biological industrial waste treatment, Desulfovibrio desulfuricans.

A strain of Desulfovibrio Desulfuricans was used to test the feasibility of treating acid mine water biologically. Sulfate reduction rates were measured with lactate media at different temperatures, influent pH, and sulfate concentrations in batch and continuous reactors. Among the several additional organic substrates tested, digester sludge appears to be the most attractive because of its low cost and its neutralizing properties. Sulfate reduction in mixtures of acid mine water and digester sludge were demonstrated in a semi-continous reactor and the sulfate reduction rates were measured. The controlling factors of sulfate reduction are discussed.

PB-213 939/5
Illinois Univ., Urbana.
AN ANALYSIS OF INSTITUTIONAL SOLID WASTES.
Open-file rept.,
Stewart A. Messman. 1971, 72p EPA-SW-2tg
Grant G06-EC-00032

Descriptors: (*Waste disposal, *Universities), Reviews, Design, Efficiency, Collecting methods, Incinerators, Earth fills, Composts, Grinding (Comminution), Cost estimates.
Identifiers: *Solid waste disposal, Sanitary landfills, University of Illinois.

The study of institutional solid waste systems has received very little attention compared to municipal refuse systems and individual disposal methods. Reclamation or salvage methods are particularly favorable for institutional solid waste systems due to the relative homogeneity of waste materials from individual waste sources. The evaluation of present institutional solid waste systems and the design of proposed systems are discussed. The University of Illinois is studied to provide an example of an institutional solid waste system. (Author)

PB-213 943/4
Environmental Protection Agency, Rockville, Md. Office of Research and Monitoring.
IMPROVED PHOTOGRAPHIC LEAK TEST SYSTEM FOR SEALED SOURCES OF RADIUM 226,
P. H. Bedrosian, and E. L. Sensintaffar. 1971, 5p
Pub. in the American Jnl. of Roentgenology, Radium Therapy and Nuclear Medicine, v112 n4 p788-791 Aug 71.

Descriptors: (*Radium isotopes, Radiation shielding), (*Alpha particle detectors, Leakage), Photographic equipment, Radon isotopes, Radiation hazards.
Identifiers: Radium 226.

Two photographic methods for leak testing sealed sources of radium 226 have been documented. Both procedures use high-speed photographic emulsion to detect light produced by interactions between a ZnS screen and alpha particles emitted by leaking sources. The Polaroid Lane 4 x 5 film system, which includes individually packeted photographic film and film holder, is used in these methods. (Author)

PB-213 954/5
Woods Hole Oceanographic Institution, Mass.
ADSORPTION OF CHLORINATED HYDROCARBONS FROM SEAWATER BY A CROSSLINKED POLYMER.
Technical rept.,
George R. Harvey. Nov 72, 37p WHOI-72-86

Descriptors: (*Adsorption, *Chlorine organic compounds), (*Ion exchange resins, *Adsorbents), (*Water analysis, Chlorine organic compounds), Concentrating, Styrene copolymers, Regeneration (Engineering), Sea water, Water pollution, Flow rate, Performance evaluation, DDT, Pesticides, Oceans.
Identifiers: Amberlite polymers, Biphenyl/chloro.

A synthetic resin, Amberlite XAD-2, has been evaluated as an adsorption medium for chlorinated hydrocarbons dissolved in seawater. The resin was found to be very efficent and the method was developed into a routine analytical procedure for the monitoring of seawater. (Author)

PB-213 959/0
Environmental Protection Agency, Washington, D.C. Water Quality Office.
COST EFFECTIVENESS AND CLEAN WATER. ANNUAL REPORT TO THE CONGRESS.
Final draft.

Jan 71, 140p

Descriptors: (*Water pollution, *Cost analysis), (*Water quality, Cost analysis), Government policies, National government, Trends, Capitalized costs, Economic analysis, Operating costs, Cost effectiveness, Industrial wastes, Assessments, Sewage treatment, State government, Forecasting, Industrial waste treatment, Biochemical oxygen demand.
Identifiers: Sewage treatment plants, *Water pollution economics, Water pollution abatement.

The report coosiders the question of efficiency in Federal actions towards waste water treatment, directing its attention to: The distribution of investments as compared to the distribution of poluting activities and the location of water pollution; The results of municipal and industrial waste treatment investments made over the life of the Federal construction grant program, in terms of

reduction of oxygen demand and nutrients in sewage; Avoidable increase in local operating, maintenance, financing, and overhead costs of waste treatment; and The questionable strategy of making use of investment capital essentially to forestall some future needs, and at the same time permitting the persistence of existing treatment system deficiencies.

PB-213 960/7
Environmental Protection Agency, Washington, D.C. Office of Water Programs.
THE USE OF PESTICIDES IN SUBURBAN HOMES AND GARDENS AND THEIR IMPACT ON THE AQUATIC ENVIRONMENT.
Pesticide study series no. 2,
R. V. Rumker, R. M. Matter, D. P. Clement, and F. K. Erickson. May 72, 501p*
Contract EPA-68-01-0119
Prepared in cooperation with Ryckman, Edgerley, Tomlinson and Associates, Inc.
Paper copy available from GPO $3.50 as stock no. EP2.25:2.

Descriptors: (*Pesticides, *Water pollution), Houses, Consumption, Ecology, Soil chemistry, Hydrology, Containers, Waste disposal, Reviews, Insecticides, Residues, Aquatic biology, Food chains, Fishes, Legislation, National government, State government, Government policies, Regulations, Toxicology, Texas, Pennsylvania, Michigan.
Identifiers: Path of pollutants, Pesticide residues, Synergism, Philadelphia (Pennsylvania), Dallas (Texas), Lansing (Michigan).

The present study is concerned with the use of pesticides in suburban homes and gardens in three different metropolitan areas, Philadelphia, Pennsylvania; Dallas, Texas; and Lansing, Michigan. The report describes the following: Analyzes, describes, and documents quantitatively the use of pesticides in suburban homes and gardens; evaluates and documents quantitatively the direct and indirect impact on the natural environment resulting from pesticide uses, with special emphasis on the movement of pesticides and their possible metabolites and degradation products; pinpoints areas of actual or potential environmental damage; provides a basis for systematic correction of such damage to the natural environment; and describes applicable local and state laws and regulations, and evaluate their effectiveness in preventing environmental damage.

PB-213 961/6
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Management Office.
RECYCLING ASSESSMENT AND PROSPECTS FOR SUCCESS,
Arsen Darnay. 1972, 14p EPA-SW-81
Paper copy available from GPO $0.15 as EP1.17:81.

Descriptors: (*Waste disposal, Utilization), Materials recovery, Reclamation, Forecasting, Government policies.
Identifiers: *Waste recycling.

The author looks at our attitudes towards waste. He then proceeds to discuss the future of recycling and materials recovery.

PB-213 974/9
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
DIGITAL COMPUTER PROGRAMS FOR THE COST ENGINEER.

Mar 71, 30p*

Descriptors: (*Sewage treatment, Computer programming), (*Industrial waste treatment, Computer programming), Cost engineering, Water reclamation, Water supply, Electrodialysis, Osmosis, Sludge disposal, Calcium oxides, Activated sludge process, Trickling filtration, Ion exchanging, Salaries, Sanitary engineering, Sewers.
Identifiers: Sewage treatment plants, Tertiary sewage treatment, Reverse osmosis, Ammonia stripping, Microscreening.

The report presents an annotated list of computer programs of interest to the operation and design of waste water treatment plants. Most of these programs include some type of cost calculation. A summary of each one and where it is available is given.

PB-214 002/8
Aerotherm Corp., Mountain View, Calif.
DESIGN OF A PARTICULATE AERODYNAMIC TEST FACILITY.
Final rept. 7 Dec 70-7 Oct 71,
Larry W. Anderson, William F. Lapson, and John W. Schaefer. 7 Dec 71, 134p Aerotherm-71-43
APTD-1158
Contract EPA-71-44

Descriptors: (*Air pollution, *Particles), (*Wind tunnels, Air pollution), Laboratories, Design, Test facilities, Dust, Combustion products, Gas sampling, Engineering drawings.

Aerosols emitted from stationary sources constitute one of the most common and readily observable air pollutants currently being subjected to control measures. Further advancement in the particulate control state of the art will require basic information on the general behavior of particulates in flue gases. In addition, more sophisticated and automated instrumentation to test the performance of control equipment or compliance with air pollution regulations is needed. The research described concerns this new instrumentation. The report documents the results of a study to develop a preliminary or conceptual design for a particulate aerodynamic test facility. Basic features of other aerodynamic test facilities are reviewed, and features which are needed in the present design are identified. Engineering tradeoffs and technical considerations are presented. A detailed description of the final facility design is presented along with the controls and instrumentation.

PB-214 008/5
Syracuse Univ. Research Corp., N.Y. Life Sciences Div.
FIELD EVALUATION OF METHODS OF COLLECTION AND ANALYSIS OF AIRBORNE PESTICIDES. VOLUME I. FIELD EVALUATION AND ANALYSIS,
Bill Compton, Patricia P. Bazydlo, and Gunter Zweig. May 72, 154p* EPA-R2-72-004-Vol-1
Contract CPA-70-145
See also Volume 2, PB-214 009.

Descriptors: (*Pesticides, *Gas sampling), (*Air pollution, Pesticides), Gas chromatography, Monitors, Design, Samplers, Concentration (Composition), Field tests, Cottonseed oil, Adsorbents, Aldrin, DDT, Heptachlor, Endrin, Computer programs, FORTRAN.
Identifiers: *Air pollution sampling, DDD pesticide, DDE pesticide, D 2-4 herbicide, Parathion, Sumithion, Methyl parathion, Air pollution detection.

The report describes field tests of a pesticide monitor which uses refined cottonseed oil on glass beads to adsorb the pesticides. The design of the sampler is given along with techniques for extraction and gas chromatographic analysis of the samples. Field test results are discussed.

PB-214 009/3
Syracuse Univ. Research Corp., N.Y. Life Sciences Div.
FIELD EVALUATION OF METHODS OF COLLECTION AND ANALYSIS OF AIRBORNE PESTICIDES. VOLUME II. PESTICIDE FIELD MONITORING DATA,
Bill Compton, Patricia P. Bazydlo, and Gunter Zweig. May 72, 219p EPA-R2-72-004-Vol-2
Contract CPA-70-145
See also Volume 1, PB-214 008.

Descriptors: (*Pesticides, *Gas sampling), (*Air pollution, Pesticides), Concentration (Composition), Texas, New York, Florida, Aldrin, DDT, Heptachlor, Endrin.
Identifiers: *Air pollution sampling, Air quality data, DDD pesticide, DDD pesticide, D 2-4 herbicide, Parathion, Sumithion, Methyl parathion.

The report is an appendix to the previous volume which describes the design, use, and field tests of a gas sampler for airborne pesticides. Air quality data of pesticide is given for Winter Haven, Florida; Buffalo, New York; Rome, New York; Jordan, New York; Lafayette, New York; Naples, New York; Syracuse, New York; and Lubbock, Texas. The data presented is compatible with the data requirements of the SAROAD (Storage and Retrieval of Air Quality Data) developed at EPA, and is presented in such a manner that the data may be directly keypunched.

PB-214 011/9
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
MERCURY AND AIR POLLUTION: A BIBLIOGRAPHY WITH ABSTRACTS,

Oct 72, 65p* AP-114
Paper copy also available from GPO $1.25 as EP4.9-114.

Descriptors: (*Air pollution, *Mercury (Metal)), (*Bibliographies, Air pollution), Sources, Gas analysis, Gas sampling, Public health, Plants (Botany), Livestock, Standards, Legislation, Law (Jurisprudence), Mecury poisoning, Toxicology, Industrial wastes.
Identifiers: Air pollution control, Air pollution detection, Air pollution effects (Animals), Air pollution effects (Plants).

An annotated bibliography presents a compilation of abstracts which deal with mercury and air pollution. The abstracts are arranged within the following categories: Emission sources; Control methods; Measurement methods; Air quality measurements; Atmospheric interaction; Basic science and technology; Effects-Human health; Effects-Plants and livestock; Standards and criteria; Legal and administrative; and Social aspects.

PB-214 012/7
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PROCEEDINGS OF THE SOLID WASTE RESOURCES CONFERENCE ON DESIGN OF CONSUMER CONTAINERS FOR RE-USE OR DISPOSAL, MAY 12 AND 13, 1971,
George F. Sachsel. 1972, 341p* EPA-SW-3p
Paper copy also available from GPO $1.75 as EP1.17:3p.

Descriptors: (*Waste disposal, *Containers), Meetings, Utilization, Materials recovery, Metal scrap, Plastics, Glass, Waste papers, Composite materials, Separation, Reclamation.
Identifiers: *Waste recycling, Glass recycling, Metal recycling, Paper recycling, Plastic recycling, *Solid waste disposal, Disposable containers.

The report is based on a symposium held May 12 and 13, 1971, in Columbus, Ohio. Each of the four parts of these proceedings, corresponding to the sessions of the symposium, brings together current knowledge and thinking in the disposal and reclamation of consumer containers. The contents include topics on the following disposal areas: Plastics, composites and paper (Incentives for the

recycling and reuse of plastics, thermoplastics in waste recycling, Polytrip, the returnable plastic milk bottle system, reclamation of plastic-paper composites, paper industry plans); Glass containers (Design trends in glass containers, re-using scrap glass, techniques for self-disposal, composite bottle design and disposal, separation of glass from municipal refuse); Metallic containers (Ferrous scrap recycling and steel technology, metallurgical aspects of reclaiming container scrap, recovery and utilization of aluminum from solid waste).

PB-214 016/8
Bureau of Labor Statistics, Washington, D.C.
MUNICIPAL COLLECTIVE BARGAINING AGREEMENTS IN LARGE CITIES.
Final rept. for 1970,
Richard R. Nelson. 1972, 76p DOL-BLS-B-1759
Paper copy available from GPO $1.25 as L.2.3:1759.

Descriptors: (*Bargaining, Agreements), (*Municipalities, *Personnel management), Local government, Urban areas, Industrial relations.
Identifiers: Collective bargaining.

The bulletin provides a descriptive and statistical discussion of the general characteristics of collective bargaining procedures between municipal governments and their employees in cities that had populations of 250,000 or more in 1970. Sample provisions of negotiated agreements are given. (Author)

PB-214 019/2
California State Dept. of Public Health, Berkeley.
CALIFORNIA SOLID WASTE MANAGEMENT STUDY (1968) AND PLAN (1970).

1971, 282p PHS-Pub-2118, EPA-SW-2tsg
Grant PHS-UI-00008
Library of Congress Catalog Card No. 77-608769.
Paper copy available from GPO $2.50 as EP3.2:C12.

Descriptors: (*Waste disposal, *California), Management planning, Regional planning, Environmental surveys, Sources, Industrial wastes, State government, Collecting methods, Site surveys, Public health, Water pollution.
Identifiers: *Solid waste disposal.

The present document publishes the data base for the California solid waste management plan. The plan report presents and analyzes pertinent solid waste data, identifies problems indicated by the data, sets objectives that if achieved would solve identified problems, and finally, proposes immediate, intermediate, and long-range measures for achieving objectives.

PB-214 028/3
Illinois State Geological Survey, Urbana.
HYDROGEOLOGY OF SOLID WASTE DISPOSAL SITES IN NORTHEASTERN ILLINOIS.
Final rept. 1 Jun 66-31 May 68,
G. M. Hughes, R. A. Landon, and R. N. Farvolden. 1971, 168p EPA-SW-12d
Grant PHS-EC-00006
International Standard Book no. 5502-0034.
Paper copy available from GPO $1.50 as EP3.2:H99.

Descriptors: (*Earth fills, *Hydrology), (*Waste disposal, Earth fills), (*Water pollution, Earth fills), Ground water, Illinois, Leaching, Permeability, Soil properties, Water quality, Biodeterioration.
Identifiers: *Solid waste disposal, *Sanitary landfills, Dissolved solids, Path of pollutants.

The study attacks one of the problems inherent in disposing of refuse on land: the ever-present danger that-unless properly engineered in a sanitary landfill--the wastes will adversely effect ground-water resources. Hydrogeologic and water quality studies of five landfills in northeastern Illinois were carried out. The distribution and concentration of dissolved solids in the vicinity of four of these landfills was found to be controlled by the configuration of the ground-water flow system. The major factors influencing the attenuation of the dissolved solids appear to be the particle size of the earth materials through which they move and the distance that they move.

PB-214 029/1
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Management Office.
AN ACCOUNTING SYSTEM FOR TRANSFER STATION OPERATIONS,
Eric R. Zausner. 1971, 23p EPA-SW-38ts
PHS-Pub-2034
Library of Congress Catalog Card no. 74-611843.
International Standard Book no. 5502-0026.
Paper copy available from GPO $0.30 as EP3.2:AC2/2.

Descriptors: (*Waste disposal, *Accounting), Collection, Hauling, Cost analysis, Operating costs, Financing, Forms (Paper), Maintenance.
Identifiers: Waste transfer stations, *Solid waste disposal.

The increasing costs and complexities of solid waste handling require new, more sophisticated management techniques. Data on performance and the costs of operation and ownership are essential for the use of these management tools. A good information system is, therefore, a prerequisite to effective management. The proposed system provides a guide to the type and quantity of information to be gathered, its classification, and the method of collection. It is intended to be of use to municipal or private personnel involved in transfer station operation and ownership.

PB-214 031/7
TRW Systems Group, Redondo Beach, Calif.
NEW CHEMICAL CONCEPTS FOR UTILIZATION OF WASTE PLASTICS: AN ANALYTICAL INVESTIGATION,
M. E. Banks, W. D. Lusk, and R. S. Ottinger. 1971, 136p EPA-SW-16c
Contract PH-86-68-206
International Standard Book no. 5502-0044.
Paper copy available from GPO $1.25 as EP3.2:P69/2.

Descriptors: (*Plastics, *Waste disposal), (*Materials recovery, Plastics), Utilization, Thermochemistry, Decomposition, Reaction kinetics, Polystyrene, Polyvinyl chloride, Polyethylene, Computer programs, Air pollution, Combustion products, Pyrolysis, Raw materials.
Identifiers: *Plastic recycling, *Waste recycling, *Solid waste disposal.

The objectives of the research were as follows: To identify waste plastic/coreactant reaction products with potential commercial value; To identify waste plastic/air combustion products that are potential air pollutants; and To conceive of and provide technical and economic evaluations for chemical processes using waste plastics as raw materials. The report presents the approaches, methods, and results of these various phases of the technical-economic analyses performed on waste plastic utilization systems. The general approach and analytical tools employed are presented. The determination of the equilibrium species distributions and reaction path analyses are given. The kinetic analyses and preliminary design and economic analyses are also discussed. The conclusions and recommendations include not only the proposed selection of processes for further application, but also other implications, for air pollution.

PB-214 032/5
IIT Research Inst., Chicago, Ill.
FEASIBILITY STUDY OF THE DISPOSAL OF POLYETHYLENE PLASTIC WASTE,
Kurt Gutfreund. 1971, 53p EPA-SW-14c,
PHS-Pub-2110
Contract PH-86-67-274
International Standard Book No. 5502-0036.
Paper copy available from GPO $0.55 as EP3.2:P76.

Descriptors: (*Waste disposal, *Polyethylene), (*Decomposition reactions, *Olefin resins), Packaging materials, Biodeterioration, Oxidation, Nitric acid, Differential thermal analysis, Infrared spectroscopy, Ultraviolet radiation, Calorimetry, Mechanical properties, Heat of combustion, Ultrasonic radiation, Ozonization, Incinerators.
Identifiers: *Solid waste disposal.

Synthetic plastics as polyethylene do not decompose when disposed of in landfills and can cause air pollution problems if burned. An efficient, safe, and economical method for the disposal of wastes as polyethylene is needed. A feasibility study directed toward these objectives and designed to determine the applicability of selected approaches to the problem of polyethylene disposal has been conducted. Particular attention was given to chemical methods of modifying the polyolefin and the effects of the treatments on the mechanical, thermal, and biological properties of the polymer. One of the methods discussed that has appeared particularly attractive involves the oxidative degradation and concomitant nitration of polyethylene by exposure to red fuming nitric acid, or binary systems including HNO3, as a constituent.

PB-214 039/0
National Association of Counties Research Foundation, Washington, D.C.
GUIDELINES FOR LOCAL GOVERNMENTS ON SOLID WASTE MANAGEMENT.

1971, 194p* EPA-SW-17c
Contract PH-86-67-290
Paper copy available from GPO $1.50 as stock no. 5502-0047.

Descriptors: (*Waste disposal, *Local government), Management planning, Government policies, Legislation, Regional planning, Publicity, Storage, Collecting methods, Hauling, Financing, Public opinion, Personnel.
Identifiers: *Solid waste disposal.

Ten guides have been prepared on solid waste management to assist local elected and appointed policy making officials. These guides cover the following topics: Areawide approaches; Legal authority; Planning; Organization; Design and operation; Financing; Technical and financial assistance; Citizen support; Personnel; and an Action plan and bibliography.

PB-214 041/6
Environmental Protection Agency, Ann Arbor, Mich. Div. of Advanced Automotive Power Systems Development.
PROTOTYPE VEHICLE PERFORMANCE SPECIFICATION.

3 Jan 72, 13p*

Descriptors: (*Automobiles, Specifications), Performance, Internal combustion engines, Suspension systems (Vehicles), Brakes (Motion arresters), Weight (Mass), Air resistance, Rolling friction, Exhaust gases, Emission, Acceleration, Fuel consumption, Reliability, Maintainability, Safety devices.
Identifiers: Performance specifications.

The derived criteria are based on typical characteristics of the class of passenger automobiles with the largest market volume produced in the U.S. during the model years 1969 and 1970. It is noted that emissions, volume and most weight characteristics presented are maximum values while the

performance characteristics are intended as minimum values. (Author)

PB-214 045/7
Little (Arthur D.), Inc., Cambridge, Mass.
INCENTIVES FOR RECYCLING AND REUSE OF PLASTICS.
Final rept.,
Jack Milgrom. 1972, 316p* EPA-SW-41c-72
Contract PHS-CPE-R-70-0048

Descriptors: (*Plastics, *Waste disposal), (*Materials recovery, Plastics), Utilization, Plastics industry, Resources, Circulation, Reclamation, Plastics processing, Scrap, Economic analysis, Strategy, Legislation, Government policies, Taxes, Cost analysis, Supply (Economics), Containers.
Identifiers: *Plastic recycling, *Waste recycling, *Solid waste disposal, Decondary materials industry, Polymer additives.

There were two aspects to this study: To develop a descriptive model of the plastics cycle; and, To develop complete strategies for promoting the recycling and reuse of plastics. The study is reported in five parts. Part I contains a discussion of the technology of plastics, which provides the basis for understanding the technical problems of recycling. Part II describes the economics of the plastics industry needed to develop and assess the strategies for recycling plastics and discusses the market for both virgin and secondary materials. Part III describes in detail the entire plastics cycle as they are manufactured, starting from petrochemicals until they become a plastic end product in the hands of the consumer. Part IV provides an analysis of the existing state of the art of methods for isolating plastics from the solid waste stream and of applications for the scrap material. In Part V the strategies for promoting the recycling and reuse of plastics are developed and described in detail.

PB-214 053/1
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
DEVELOPMENT OF THE AQUEOUS PROCESSES FOR REMOVING NO (X) FROM FLUE GASES,
Gilford A. Chappell. Sep 72, 112p* EPA-R2-72-051
Contract EPA-68-02-0220

Descriptors: (*Nitrogen oxides, *Adsorption), (*Air pollution, Nitrogen oxides), Adsorbents, Chemisorption, Scrubbers, Sodium sulfites, Limestone, Hydroxides, Flue gases, Mixtures, Sulfur dioxide, Carbonates.
Identifiers: *Alkaline scrubbing, Wet methods, *Air pollution control.

A screening study was conducted to evaluate the capability of aqueous solutions to scrub NO (x) from the flue gases emitted by stationary power plants fired with fossil fuels. The key findings discussed include: The addition of NO2 to flue gas to improve NO (x) (mostly NO) absorption does not appear promising; Sulfite solutions and slurries are efficient NO2-SO2 absorbents; Calcium magnesium, and zinc hydroxide slurries are effective NO2-SO2 absorbers; Limestone (CaCO3) is also a good NO-SO2 absorbent for the same reasons as for Ca (OH)2; NO2 scrubbing is enhanced by removing oxygen from the flue gas or by adding an anti-oxidant such as hydroquinone to the scrubbing solution; Sulfide solutions are excellent NO2 and SO2 absorbers but do generate a small amount of NO; and Part of the absorbed SO2 is oxidized to sulfate. Combined NO (x)-SO (x) scrubbing seems feasible using any of several hydroxide or carbonate systems provided NO (x) (NO) can be efficiently oxidized to NO2 upstream from the scrubbing unit. (Author)

PB-214 056/4
Environmental Protection Agency, Washington, D.C.
JOINT USPHA-TVA COMPOSTING PROJECT, JOHNSON CITY, TENNESSEE.
Interim rept. Jun 67-Sep 69.

1972, 223P EPA-SW-31r.1

Descriptors: (*Waste disposal, *Composts), Waste treatment, Performance evaluation, Industrial plants, Cost estimates, Sludge disposal, Agricultural wastes, Microorganisms, Operating costs, Construction costs, Grinding (Comminution), Public health, Capitalized costs, Chemical analysis.
Identifiers: *Solid waste disposal, Paunch.

The report discusses research to provide more comprehensive knowledge about windrow composting as a solid waste management tool and permit better assessment of available information about this subject. Results of investigations and operational experiences obtained from the project during the period June 1967 to September 1969, are discussed. The project was located at Johnson City, Tennessee. During the period, an average of 34 tons of raw refuse per day was processed. Investigations of the potential hazard to health from pathogenic organisms in compost were conducted. Sewage sludge, cow manure, paunch manure, aged poultry manure, animal blood, and pepper canning wastes in varying amounts were all successfully composted. Because production of an acceptable grade of compost was delayed, insufficient data was available to assess the agricultural value of the compost produced.

PB-214 057/2
Environmental Protection Agency, Chicago, Ill. Div. of Air and Water Programs.
EVALUATION OF THE OHIO WATER SUPPLY PROGRAM.

Jul 72, 191p
See also PB-214 058.

Descriptors: (*Ohio, *Water supply), (*Water services, Ohio), Potable water, Inspection, Bacteria, Public health, Government policies, State government, Management planning, Budgeting, Water analysis, Site surveys, Water analysis, Fluoridation, Regulations.

The report presents the Environmental Protection Agency's findings, conclusions, and recommendations, with supporting data and explanatory text of the study of the Ohio public drinking water supply program. Recommendations are given for ways to update and improve the state role in inspecting these services.

PB-214 058/0
Environmental Protection Agency, Chicago, Ill. Div. of Air and Water Programs.
EVALUATION OF THE OHIO WATER SUPPLY PROGRAM: SUMMARY.
Jul 72, 23p
See also PB-214 057.

Descriptors: (*Ohio, *Water supply), (*Water services, Ohio), Potable water, Inspection, Bacteria, Public health, Government policies, State government, Management planning, Site surveys.

The evaluation was conducted to determine the effectiveness of the Ohio Public Water Supply Program and to determine what improvements, if any, are needed to assure safe, wholesome drinking water for the residents of Ohio. The report is a summary of a larger study (PB-214 057) and is intended for those who do not wish the detail of the complete report.

PB-214 059/8
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
PHOSPHORUS REMOVAL PRACTICE,
James F. Kreissl. 1971, 30p
Presented at the Sanitary Engineering Institute, University of Wisconsin, Madison, Wisconsin, March 9-10, 1971.

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Phosphorus, *Chemical removal (Sewage treatment)), Nutrients, Cost estimates, Iron chlorides, Alums, Aluminum inorganic compounds, Calcium oxides, Precipitation (Chemistry), Settling.
Identifiers: Secondary sewage treatment, Tertiary sewage treatment.

Examples of available phosphorus removal processes are presented in the form of results from specific installations. Installations were chosen to illustrate specific types of phosphorus removal systems. Primary, secondary, and tertiary chemical-addition techniques are emphasized due to their higher reliability and lower costs. (Author)

PB-214 064/8
IIT Research Inst., Chicago, Ill.
INTERACTIONS OF VARIOUS AIR POLLUTANTS ON CAUSATION OF PULMONARY DISEASE.
Final rept. 28 Sep 70-27 Sep 72,
Richard Ehrlich, and James D. Fenters. 30 Oct 72, 64p* IITRI-L6061-8 EPA-R1-72-003
Contract EPA-71-37

Descriptors: (*Respiratory diseases, *Air pollution), (*Public health, Air pollution), (*Nitrogen dioxide, Respiratory diseases), (*Nickel oxides, Respiratory diseases), (*Chromium oxides, Respiratory diseases), Immunology, Infectious diseases, Viral diseases, Bacterial diseases, Laboratory animals, Exposure, Experimental data.

The report presents a summary of various studies on the effect of exposure to nitrogen dioxide, chromium trioxide, and nickel oxide on the resistance of experimental animals to bacterial and viral infection. The following studies were conducted in this research program: (1) Long-term exposure of squirrel monkeys to NO2; (2) Interaction of nickel oxide and respiratory infection in hamsters; (3) Interaction of chromium trioxide and respiratory infection in mice; and (4) Immune response in mice during long-term NO2 exposure. This last study has not been completed, however, all data available to date are summarized in the report.

PB-214 071/3
Environmental Protection Agency, Washington, D.C.
TOWARD A NEW ENVIRONMENTAL ETHIC.
Sep 71, 28p
Paper copy available from $0.60 as stock no. 5500-0031.

Descriptors: (*Pollution, *Government policies), (*Air pollution, Government policies), (*Water pollution, Government policies), National government, Waste disposal, Noise (Sound), Reviews.
Identifiers: *Solid waste disposal, *Noise pollution, Government agencies.

The pamphlet briefly reviews the purposes and functions of the Environmental Protection Agency.

PB-214 072/1
Environmental Protection Agency, Kansas City, Mo. Region VII.
WATER QUALITY INVESTIGATIONS: SOURIS RIVER BASIN, NORTH DAKOTA 1969,
Bob Hegg. Feb 71, 72p

Descriptors: (*Souris River, *Water quality), (*Water pollution, Souris River), (*North Dakota, Water pollution), International relations, Canada, Industrial wastes, Sources, Sewage, Agricultural wastes, Surface water runoff, Assessments,

Water analysis, Inventories, Aquatic microbiology, Nutrients, Dissolved gases, Biochemical oxygen demand, Indicator species.

The Souris River is an international stream which originates in the Province of Saskatchewan, Canada. The river flows southward from Canada into North Dakota and then, after making a large horseshoe bend, flows northward into the Canadian Province of Manitoba. Water uses in the United States affect both the quality and quantity of water released to Canada. Since the Basin's water supply is not adequate to meet the needs of all potential water uses, conflicts exist over priority of water use. Large variations in annual runoff compound these water use conflicts. Waste sources include untreated and inadequately treated municipal and industrial wastes, agricultural wastes, urban runoff, rural runoff, and several large wildlife refuges. The primary objectives of the report are to: Assess the impact of municipal and industrial waste discharges on water quality; Define water quality conditions in the wildlife refuge areas; and Provide background data on inorganic constituents in the river system as a basis for evaluating the water quality effects of the Garrison Diversion Irrigation Project.

PB-214 073/9
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
CREATING A COUNTYWIDE SOLID WASTE MANAGEMENT SYSTEM. THE CASE STUDY OF HUMPHREYS COUNTY, TENNESSEE,
Maurice A. Kruth, David H. Booth, and D. L. Yates. 1972, 20p EPA-SW-110
Paper copy available from GPO $0.30 as EP1.17:110.

Descriptors: (*Waste disposal, *Tennessee), (*Regional planning, Waste disposal), Rural areas, Earth fills, Local government, Collecting methods, Cost estimates, Improvement.
Identifiers: *Solid waste disposal, Humphreys County (Tennessee), Sanitary landfills.

Rural cities and counties need economical solid waste management systems that eliminate promiscuous and open dumps. The paper discusses the creation of one such system in Humphreys County, Tennessee. Three open burning dumps and approximately 40 promiscuous roadside dumps were eliminated, while the county developed a container collection system and a central landfill. No Federal or State financial aid was used in the project. (Author)

PB-214 074/7
Stanford Research Inst., Menlo Park, Calif.
AN APPROACH TO ENVIRONMENTAL ORGANIZATION CHANGE AND MANPOWER PLANNING IN THE STATE OF OHIO.
Final rept.,
David Ackerman, Alfred Boyd, Richard Davis, Richard Schmidt, and Ward Stoneman. Sep 72, 111p
Contract EPA-68-01-0174

Descriptors: (*Environmental engineering, *Ohio), (*Manpower, Environmental engineering), (*Organizations, Planning), Management engineering, Personnel management, Environmental surveys, Pollution, Protection, Waste disposal, Natural resources.

The federal goverment sponsored the study to assist the State of Ohio in an intensive review of its environmental protection activities, which led to a recommended design for consolidation of presently separated environmentally related activities into a single State agency. The report summarizes the organizational design study effort; the assessment of environmental issues and objectives; and the study team's diagnosis of present operations, including findings and recommendations for organizational design. The new organizational design is described in detail, with examples illustrating how sample operations would be handled; and an approach to implementation of the new design is presented. (Author)

PB-214 087/9
Missouri Clean Water Commission, Jefferson City.
MISSOURI WATER QUALITY STANDARDS SUMMARY.
May 72, 43p

Descriptors: (*Missouri, *Water quality), (*Water pollution, Missouri), Standards, Sources.
Identifiers: *Water pollution standards.

Summarized are the water quality standards of the State of Missouri. The standards consist of three major components: designation of the uses which interstate waters are to serve, specification of narrative and numerical criteria to protect and enhance water quality, and specification of a plan of implementation and enforcement, which includes treatment and control requirements for municipal, industrial and other wastes discharged to or affecting interstate waters.

PB-214 088/7
Nebraska State Dept. of Environmental Control, Lincoln.
NEBRASKA WATER QUALITY STANDARDS SUMMARY.

Mar 72, 38p

Descriptors: (*Nebraska, *Water quality), (*Water pollution, Nebraska), Standards, Sources.
Identifiers: *Water pollution standards.

The summary presents water quality standards of the State of Nebraska. The standards consist of three major components: designation of the uses which interstate waters are to serve, specification of narrative and numerical criteria to protect and enhance water quality, and specification of a plan of implementation and enforcement, which includes treatment and control requirements for municipal, industrial and other wastes discharged to or affecting interstate waters.

PB-214 089/5
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
DESIGN OF A SOLID WASTE MANAGEMENT SYSTEM FOR THE EASTERN APPALACHIA HEALTH REGION OF NORTH CAROLINA,
John M. Sweeten. 1972, 94p EPA-SW-80

Descriptors: (*Waste disposal, *North Carolina), (*Regional planning, Waste disposal), Earth fills, Collecting methods, Cost analysis, Cost estimates, Hauling, Site surveys, Rural areas.
Identifiers: *Sanitary landfills, *Solid waste disposal, Alexander County (North Carolina), Burke County (North Carolina), Caldwell County (North Carolina), McDowell County (North Carolina).

The solid waste management conditions in Alexander, Burke, Caldwell, and McDowell Counties, North Carolina, were analyzed for the purpose of developing practicable solutions to the problem of improper solid waste disposal in the region. The analysis determined the optimum number and location of regional sanitary landfills which would minimize the combined regional cost of sanitary landfill operation and solid waste transportation. Equipment, personnel, and monetary requirements for a bulk container solid waste collection system serving rural residents and recreational areas currently without collection service were also determined.

PB-214 092/9
National Association of Counties Research Foundation, Washington, D.C.
DIGEST OF SELECTED LOCAL SOLID WASTE MANAGEMENT ORDINANCES,
Mel D. Powell, Bruce P. Fiedelmand, and Myong J. Roe. 1972, 393p* EPA-SW-38C
Contract CPE-69-114
Paper copy available from GPO $2.75 as EP1.17:38C.

Descriptors: (*Waste disposal, *Regulations), Local government, Government policies, Law enforcement, Legislation.
Identifiers: *Solid waste disposal.

Included in the report are digests of 100 city and county solid waste management ordinances many of which leave much to be desired. However, the digested ordinances are useful examples of how cities and counties have legislated in the past. Thus the purpose of presenting them is to aid in writing newer and better ones.

PB-214 099/4
Environmental Protection Agency, Cincinnati, Ohio.
PHOTOCHEMICAL METHODS FOR PURIFYING WATER,
C. Y. Cha, and J. M. Smith. Nov 72, 38p EPA-R2-72-104 W73-03505
Prepared in cooperation with California Univ., Davis. Dept. of Chemical Engineering.
Also available from GPO $0.70 as EP1.23/2:72-104.

Descriptors: (*Sewage treatment, *Photochemical reactions), Oxidation, Chemical reactors, Ultraviolet radiation, Reaction kinetics, Chlorination, Design criteria, Performance evaluation, Operating costs, Cost estimates, Ultraviolet lamps, Mercury lamps, Process charting Capitalized costs.
Identifiers: Tertiary sewage treatment.

The kinetics of photochemical oxidation of organic carbon pollutants, with and without sensitization by chlorine, have been determined. The results, which are suitable for use in designing reactors for any type of lamp and lamp-reactor geometry, are based upon data obtained for secondary effluents from Sacramento area municipal treatment plants. A trough reactor with parabolic reflector was the most suitable design for a large-scale, tertiary treatment plant based upon photochemical oxidation. Cost calculations were made for reducing the TOC from 10 to 4 mg/liter and maintaining a chlorine concentration of about 0.8 mg/liter. For a capacity of one-million gallons per day of secondary effluent, treatment costs are given. (Author)

PB-214 102/6
National Environmental Research Center, Research Triangle Park, N.C.
INDOOR-OUTDOOR AIR POLLUTION RELATIONSHIP: A LITERATURE REVIEW,
Ferris B. Benson, John J. Henderson, and D. E. Caldwell. Aug 72, 83p* AP-112
Also available from GPO $1.25 as EP4.9:112.

Descriptors: (*Air pollution, *Buildings), Reviews, Fungi, Pollen, Bacteria, Ventillation, Air conditioning, Residential buildings, Spores, Carbon dioxide, Sulfur dioxide, Carbon monoxide, Particles, Filtration, Diurnal variations, Seasonal variations, Concentration (Composition).
Identifiers: *Indoor air pollution.

While extensive measurements have been and are being made of outdoor pollution, very few data have been gathered on indoor pollution. The data that are available are compiled and analyzed in the report. Based on a review of the literature, it was possible to infer relationships between indoor and outdoor pollution and to identify factors that affect these relationships. The relationships identified must be considered tentative. Except for bacteria and perhaps, for fungus spores, indoor pollution levels appear to be controlled primarily by outdoor concentrations. Other factors that in-

fluence indoor pollution levels include internal activities and pollutant generation, atmospheric conditions and natural ventilation, time, location, type of building, and air conditioning and filtration systems. Indoor concentrations of pollen and reactive gases, expressed as a percentage of outdoor concentrations, decrease with increasing outdoor concentrations. Bacterial concentrations indoors appear to be more closely related to the presence and activities of people inside than to outdoor concentrations.

PB-214 103/4
Rex Chainbelt, Inc., Milwaukee, Wis.
A FREE FLOATING ENDLESS BELT OIL SKIMMER,
Robert W. Agnew. Aug 72, 99p* EPA-R2-72-006 W73-03504
Contract DI-14-12-908
Also available from GPO $1.50 as EP1.23/2:72-006.

Descriptors: (*Water pollution, Oils), (*Skimmers, *Oils), (*Absorbers (Equipment), Oils), Design, Performance evaluation, Materials recovery, Belt conveyors, Polyurethane resins, Catamarans, Boats, Bunker oils, Fuel oil, Crude oil, Computer programs, Polypropylene.
Identifiers: *Oil pollution removal, Oil pollution control, Oil spills, PETSKI computer program.

A free floating endless belt oil skimmer was developed as a means of recovering spilled oil from surface waters. The skimmer uses a unique high efficiency conveyor wringer to power and wring the belt. The belt is designed to float on the water surface and responds rapidly to the shape of the waves, thereby maximizing oil-sorbent contact time. Evaluation of the skimmer was conducted in a 60 foot diameter annular test tank under the conditions of slightly progressive waves having an amplitude of two feet. One foot wide neoprene backed polyurethane foams were utilized as the sorbent material. The experimental results indicate that the oil pickup rates will vary with the belt speed, oil slick thickness and belt porosities. The recovered liquid contained approximately 50-70% oil at 0.10 inch slick thickness. A conceptual design of a five foot wide boat mounted skimmer capable of harvesting approximately 5 acres per hour of spilled oil is presented.

PB-214 105/9
Robert S. Kerr Water Research Center, Ada, Okla.
SELECTED IRRIGATION RETURN FLOW QUALITY ABSTRACTS 1968-1969.
Annual rept. no. 1,
Gaylord V. Skogerboe, Venus T. Sahni, and Wynn R. Walker. Oct 72, 193p* EPA-R2-72-094 W73-03508
Prepared in cooperation with Colorado State Univ., Fort Collins. Agricultural Engineering Dept.

Descriptors: (*Irrigation, *Ground water recharge), (*Bibliographies, Irrigation), (*Water pollution, *Ground water), Water quality, Nutrients, Salinity, Water conservation, Aquifers, Soil chemistry, Fertilizing, Hydrology, Nitrogen, Phosphorus, Saline soils, Soil water, Subsurface drainage, Surface water runoff, Legislation, Water resources, Erosion control, Plant growth, Farm crops.
Identifiers: Return flow, Denitrification, Path of pollutants.

Research related to the quality of irrigation return flow is being conducted at numerous institutions throughout the western United States. Related work is also underway at other institutions in the United States, as well as other portions of the world. Approximately 100 sources of material have been searched for over 400 articles pertinent to the National Irrigation Return Flow Research and Development Program. These articles describe water quality problems resulting from irrigated agriculture, potential technological solutions for controlling return flows, recent research pertinent to return flow investigations, and literature associated with institutional constraints in irrigation return flow quality control.

PB-214 106/7
Environmental Protection Agency, Minneapolis, Minn. Lake Superior Basin Office.
STORAGE AND TREATMENT OF COMBINED SEWER OVERFLOWS,
Clarence C. Oster. Oct 72, 125p* EPA-R2-72-070 W73-03514
Prepared in cooperation with Banister, Short, Elliott, Hendrickson and Associates, St. Paul, Minn.
Also available from GPO $2.00 as EP1.23/2:72-070.

Descriptors: (*Combined sewers, *Water storage), (*Reservoirs, Combined sewers), (*Overflows, Combined sewers), Surface water runoff, Feasibility, Flow control, Sewage treatment, Cost estimates, Operating costs, Capitalized costs, Performance evaluation, Rainfall intensity.
Identifiers: Sewage flow rate, Chippewa Falls (Wisconsin).

The objective of this study was to demonstrate the feasibility and economic effectiveness of a combined wastewater overflow detention basin. A paved asphalt detention basin with a storage volume of 8.66 acre feet was constructed at Chippewa Falls, Wisconsin to receive overflow from a 90 acre combined sewer area including all of the central business district. The system was designed so that the stored combined sewage could be pumped to the wastewater treatment plant when precipitation subsided. There were no observed detrimental effects on treatment plant operation due to the increased intermittent flows from the detention pond. The estimated cost of operating and maintaining the pond and associated facilities are given. Capital costs are also discussed.

PB-214 107/5
Robert S. Kerr Water Research Center, Ada, Okla.
CONTROL OF MERCURY CONTAMINATION IN FRESHWATER SEDIMENTS,
George Feick, Edward E. Johanson, and Donald S. Yeaple. Oct 72, 160p* EPA-R2-72-077 W73-03517
Prepared in cooperation with the JBF Scientific Corp., Wakefield, Mass.

Descriptors: (*Water pollution, Mercury), (*Sediments, Mercury), (*Dredging, Water pollution), (*Mercury, *Chemisorption), Water chemistry, Clay soils, Adsorption, Mercury organic compounds, Thiols, Complex compounds, Inorganic sulfides, Proteins, Waste disposal, Spoil, Earth fills, Dissolved gases, Oxygen, Additives.
Identifiers: *Water pollution control, Partition coefficients, Mercury/methyl, Solid waste disposal.

Methods for controlling the release of mercury from sediments have been developed, and the effects of dredging on the redistribution of mercury have been evaluated. Laboratory studies consisted of both partitioning and aquarium experiments using artificially contaminated sediments as well as sediments from the polluted fieldogressive waves having an amplitude of two feet. One foot wide neoprene backed polyurethane foams were utilized as the sorbent material. The experimental results indicate that the oil pickup rates will vary with the belt speed, oil slick thickness and belt porosities. The recovered liquid contained approximately 50-70% oil at 0.10 inch slick thickness. A conceptual design of a five foot wide boat mounted skimmer capable of harvesting approximately 5 acres per hour of spilled oil is presented.

PB-214 111/7
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research.
PHYSICAL-CHEMICAL PROCESSES,
I. J. Kugelman, and J. M. Cohen. Mar 72, 54p
Presented at the Design Seminar for Municipal Waste Treatment Facilities. Seattle, Wash., 1-3 Dec 71.

Descriptors: (*Sewage treatment, Reviews), Precipitation (Chemistry), Calcium oxides, Activated carbon treatment, Clarification, Comparisons.
Identifiers: *Physical chemical treatment.

The report briefly describes the use of physical-chemical treatment using lime clarification and activated carbon adsorption.

PB-214 113/3
Robert S. Kerr Water Research Center, Ada, Okla.
EVALUATION OF CANAL LINING FOR SALINITY CONTROL IN GRAND VALLEY.
Environmental protection technology series,
Gaylord V. Skogerboe, and Wynn R. Walker. Oct 72, 214p W73-03518, EPA-R2-72-047
Contract DI-14-01-201
Paper copy available from GPO $2.75 as EP1.23/2:72-047.

Descriptors: (*Canal linings, *Irrigation canals), (*Colorado River, *Salinity), (*Water pollution, Salinity), Seepage, Subsurface drainage, Irrigation, Concrete structures, Saline soils, Colorado, Hydrology, Ground waters.
Identifiers: Return flow.

The report discusses a project to evaluate the salinity control effectiveness of canal and lateral linings for reduction of seepage losses into the ground water. Grand Valley in the upper Colorado River Basin was used as a model. A detailed evaluation of the necessary hydrologic and salinity parameters in the principal demonstration area was made. A hydro-salinity model has been prepared, which has allowed the itemizing of the various segments of the dual flow system into water and salt budgets for the periods prior to and immediately after the construction of the linings. In addition, the results were employed to derive some generalized valley-wide water and salt budgets. The salinity control benefits exceeded the costs of the canal lining program. (Author)

PB-214 119/0
Environmental Protection Agency, Rockville, Md.
DEVELOPING A LOCAL AND REGIONAL SOLID WASTE MANAGEMENT PLAN,
Richard O. Toftner. 1972, 100p*

Descriptors: (*Waste disposal, Management planning), Regional planning, Urban planning, Land use, Economics, Hauling, Organizing, Financing.
Identifiers: *Solid waste disposal.

The report describes the basic features of a general planning process and their use in the development of a local or regional plan for solid waste management. The purpose of the publication was to aid local and regional agencies in preparing comprehensive solid waste management plans. The publication's specific applicability to any one unique situation is not necessarily assured; the publication is intended to be flexible enough, however, to serve every agency in accordance with its own needs and special conditions.

PB-214 133/1
Stanford Research Inst., Irvine, Calif.
AIR CLASSIFICATION OF SOLID WASTES. PERFORMANCE OF EXPERIMENTAL UNITS AND POTENTIAL APPLICATIONS FOR SOLID WASTE RECLAMATION,
R. A. Boettcher. 1972, 75p* EPA-SW-30c
Contract PH-86-68-157
Paper copy available from GPO $0.75 as EP1.17:30C.

Descriptors: (*Waste disposal, *Classifiers), (*Materials recovery, Waste disposal), Classifying, Feasibility, Waste papers, Metal scrap, Automobiles, Composts, Glass, Performance evaluation, Shredding, Pilot tests.
Identifiers: *Solid waste disposal, Air classifying, Junk car disposal.

The objective of the research reported was to determine the technical feasibility of using air classification to process or treat selected types of nonhomogeneous, dry solid wastes. Design requirements for processing solid wastes with a full-scale commercial unit are estimated and the required supplemental equipment (shredders, screens, dryers) are identified. Limitations and advantages of the method are listed. The air classification method was shown to be applicable to salvage of paper, recovery of nonferrous metal from shredded automobile body waste, and processing of compost. This method was shown to be technically feasible for processing wastepaper. It was also concluded that air classification is technically feasible for processing semifibrous solid waste materials such as compost. Compost can be cleaned of glass and other contaminants that reduce its marketability.

PB-214 152/1
Midwest Research Inst., Kansas City, Mo.
SALVAGE MARKETS FOR MATERIALS IN SOLID WASTES,
Arsen Darney, and William E. Franklin. 1972, 331p* EPA-SW-29c
Contract CPE-69-3
Paper copy available from GPO $2.75 as stock no. EP1.17:29C.

Descriptors: (*Waste disposal, *Materials recovery), Economic analysis, Utilization, Plastics, Metals, Textiles, Waste papers, Glass, Elastomers, Scrap, Metal scrap, Operating costs, Cost estimates, Metal industry, Glass industry, Paper industry, Plastics industry, Textile industry, Sources, Prices, Demand (Economics), Supply (Economics), Consumption.
Identifiers: *Solid waste disposal, *Secondary materials industry, *Waste recycling, Glass recycling, Metal recycling, Paper recycling.

The document presents the findings of a study to evaluate salvage markets for commodities entering the solid waste stream. Emphasis was placed on paper, ferrous metals, nonferrous metals, glass, textiles, rubber, and plastics, however other materials are also discussed. The overall secondary industry is described along with general costs for recovery. Case studies of salvage operations for 14 areas in the U.S. are also reported.

PB-214 160/4
Rutgers - The State Univ., New Bruswick, N.J. Dept. of Biology.
1971 SURVEY AND ASSESSMENT OF AIR POLLUTION DAMAGE TO VEGETATION IN NEW JERSEY.
Alberto Feliciano. Oct 72, 52p EPA-R2-72-010
Contract EPA-68-02-0078

Descriptors: (*Air pollution, *Agricultural economics), (*New Jersey, Agricultural economics), Cost estimates, Damage, Losses, Plant diseases, Vegetable crops, Fruit crops, Oxidizers, Ozone, Peroxy esters.
Identifiers: *Air pollution effects (Plants), Peroxyacetyl nitrate.

A survey of injury resulting from air pollution episodes and assessment of their resultant effect on crop production in 1971 was conducted in New Jersey. Economic loss to crops due to air pollution was estimated at $1,183,800. The survey did not include: indirect losses such as growers' relocation cost, crop substitution losses, nor economic losses to forest trees and ornamental plants and reduction in crop yield due to invisible injury. Three hundred fifteen reported air pollution incidences were investigated and documented during the period of this survey. As a group, vegetables accounted for 51 percent ($598,099) of the total crop loss. The photochemical pollutants were responsible for 80 percent of the plant injury recorded, with ozone contributing about 60 percent and PAN 20 percent of the total. Other pollutants involved were HCl mist, chlorine gas, ethylene, fluoride, sulfur dioxide, ammonia, particulates, oil, and petroleum. (Author)

PB-214 161/2
Massachusetts Univ., Waltham. Suburban Experiment Station.
ASSESSMENT OF AIR POLLUTION DAMAGE TO VEGETATION IN NEW ENGLAND, JULY 1971-JULY 1972.
Final rept.,
John A. Neagele, William A. Feder, and C. Jeffrey Brandt. Aug 72, 26p EPA-R5-72-009
Contract EPA-68-02-0084
Report on Socioeconomic Environmental Studies.

Descriptors: (*Agricultural economics, *Air pollution), (*New England, Air pollution), Plants (Botany), Damage, Losses, Cost estimates, Agricultural products, Vegetable crops, Ornamental plants, Fruit plants, Sulfur dioxide, Oxidizers, Ethylene.
Identifiers: *Air pollution effects (Plants), Air pollution economics.

A regional survey of New England was initiated to determine the economic losses to the agricultural industry from injury caused by air pollutants. Eighty-three investigations were made in 40 countries of the six New England states. Direct air pollution injury was observed in 14 countries and accounted for 29 of the reports. Greatest economic losses were observed on vegetables and agronomic crops as well as on flowers and foliage plants. Direct economic losses were estimated to be approximately $1.1 million for the 1971-72 season. As some incidents were not reported during the survey, continuing annual losses are estimated to be approximately $1.5 million. (Author)

PB-214 162/0
Consolidated Coal Co., Library, Pa. Research Div.
LOW-SULFUR CHAR AS A CO-PRODUCT IN COAL GASIFICATION,
G. P. Curran, W. E. Clark, Melvyn Pell, and Everett Gorin. Oct 72, 70p EPA-R2-72-060
Contract EPA-EHSD-71-15

Descriptors: (*Charcoal, *Desulfurization), (*Bituminous coal, Gasification), Manufactured gas, Feasibility, Coal, Sulfur compounds, Acceptor materials, Calcium carbonates, Air pollution, Economic analysis.
Identifiers: *Low sulfur fuels, Char.

A feasibility study is presented for the case where low-sulfur char is produced as a co-product with low-sulfur producer gas in a gasification-desulfurization operation with bituminous coal. Calcium carbonate is used as a sulfur acceptor. Experimental data are also presented to support the design feasibility study. These data show that preoxidized coals are extremely responsive to desulfurization under the conditions used in the feasibility study. It is possible by this method to produce low-sulfur chars containing 0.5% or less sulfur content. The economic evaluation shows that it is possible to produce low-sulfur char at a lower Btu cost than would be the case for complete gasification to low-sulfur producer gas. The value of the char, however, as a boiler fuel is less than that of the producer gas itself. It is, therefore, concluded that there is no clear incentive to produce low-sulfur char as a co-product in a gasification-desulfurization operation. (Author)

PB-214 166/1
Metcalf and Eddy, Inc., Boston, Mass.
GENERATION OF STEAM FROM SOLID WASTES.
Final rept.

1972, 139P* EPA-SW-49d-72
Contract PHS-EC-00195
Prepared in cooperation with Lynn, Mass.

Descriptors: (*Waste disposal, *Heat recovery), (*Waste heat boilers, Waste disposal), (*Combustion, *Refuse disposal), Cost estimates, Site surveys, Personnel selection, Shredding, Design criteria, Plant layout, Massachusetts, Feasibility.
Identifiers: *Solid waste disposal, Waterwall incinerators, Lynn (Massachusetts).

The economic feasibility of a refuse-fired waterwall incinerator that would supply steam to an industrial firm is investigated for a community looking for an acceptable solid waste disposal method. The city of Lynn, Massachusetts was used as an example. Several different combinations of grate type, equipment ownership, and equipment location are cost-compared in detail. Plant equipment components and manpower requirements are described. Other solid waste disposal alternatives are discussed. It was concluded that for Lynn, a waterwall incinerator facility is the region's most feasible future solid waste disposal method.

PB-214 167/9
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
AIR QUALITY DATA FOR SULFUR DIOXIDE, 1969, 1970, AND 1971.

Nov 72, 29p* APTD-1354

Descriptors: (*Air pollution, *Sulfur dioxide), Urban areas, Rural areas, Tables (Data).
Identifiers: *Air quality data, National Air Surveillance Network.

Air quality data for sulfur dioxide 1969 through 1971, urban and nonurban sites, are presented. The data reported have been gathered at the cooperating stations of the National Air Surveillance (NASN) network. The sulfur dioxide samples were collected by bubbling air through a solution of potassium tetrachloromercurate and analyzed using the West Gaeke method. Valid data are presented as annual sample cumulative frequency distributions. The arithmetic and geometric mean are included. (Author)

PB-214 170/3
State Univ. of New York, Scotia. Armospheric Sciences Research Center.
STUDY OF MARITIME AEROSOLS. REPORT TO ENVIRONMENTAL PROTECTION AGENCY. DIVISION OF METEOROLOGY, RESEARCH TRIANGLE PARK, NORTH CAROLINA,
A. W. Hogan, M H. Degani, and C. Thor. 1 Sep 72, 45p EPA-R3-72-025
Contract EPA-70-64

Descriptors: (*Aerosols, *Marine atmospheres), (*Air pollution, Aerosols), Concentration (Composition), Sources, Atlantic Ocean, Pacific Ocean.
Identifiers: Sinks (Biosphere).

The results are presented of research which was conducted for the purpose of surveying the atmospheric aerosol concentration over the seas, using the information gathered to evaluate the sources and sinks of these particles, and of beginning a chronology of such observations. A portable, photoelectric aerosol detector was supplied to the navigation officer of each cooperating ship. An aerosol observation was made four times each day. Additional data inputs were received from oceanographic ships, ocean station, and island observers. Some of the results of this data are presented.

PB-214 173/7
Council on Environmental Quality, Washington, D.C.
INTEGRATED PEST MANAGEMENT.

Nov 72, 51p
Paper copy available from GPO $0.55 as stock no. 411-0010.

Descriptors: (*Agriculture, *Pest control), Pesticides, Ecology, Genetics, Plants (Botany), Breeding, Microbiology, Parasitology.
Identifiers: Biological pest control.

A detailed description of the integrated pest management approach, its stage of development, and the federal effort being initiated to promote its further development and use. It is the result of a CEQ study to define positive approaches in alleviating the problems now being encountered with some agricultural pest control practices.

PB-214 176/0
TRW, Inc., McLean, Va. Transportation and Environmental Operations.
PREDICTION OF THE EFFECTS OF TRANSPORTATION CONTROLS ON AIR QUALITY IN MAJOR METROPOLITAN AREAS.

Nov 72, 132p* APTD-1363
Contract EPA-68-02-0048
See also PB-213 379.

Descriptors: (*Air pollution, *Exhuast gases), (*Urban transportation, Air pollution), (*Urban planning, Air pollution), Forecasting, Abatement, Motor vehicles, Sources, Atmospheric diffusion, Maintenance, Inspection, Vehicular traffic control, Strategies, Carbon monoxide, Hydrocabons, Nitrogen oxides, Urban areas, Illinois, New York, Colorado, California, District of Columbia.
Identifiers: Automobile exhaust, *Air pollution abatement, Implementation, Air Pollution Planning Program, Motor vehicle inspection, Chicago (Illinois), New York (New York), Denver (Colorado), San Francisco (California), Los Angeles (California).

A project is described which had the objectives of evaluating transportation controls in the reduction of motor vehicle emissions and to predict the impact of the expected emission reductions on air quality in six metropolitan areas. The companion report, 'Evaluating Transportation Controls to Reduce Motor Vehicle Emissions in Major Metropolitan Areas' (PB-213 374) provided a general analytic framework upon which these more specific analyses of the six metropolitan areas was prepared. This report details the data collection and specific analysis performed in Chicago, New York, Denver, San Francisco, Los Angeles, and Washington, D.C. The sources of transportation and other data are identified and the limitations of the data base are described. Analytic projection of emission rates and predicted concentration levels are given for each of the defined transportation control conditions. (Author)

PB-214 179/4
PEDCo-Environmental Specialists, Inc., Cincinnati, Ohio.
GUIDELINES FOR TECHNICAL SERVICES OF A STATE AIR POLLUTION CONTROL AGENCY,
George A. Jutze. Nov 72, 296p* APTD-1347
Contract EPA-68-02-0211

Descriptors: (*Air pollution, *State government), (*Law enforcement, Air pollution), Handbooks, Organization theory, Chemical analysis, Monitors, Law (Jurisprudence), Data acquisition, Management planning, Regulations, Gas sampling, Services, Litigation.
Identifiers: Government agencies, Implementation Air Pollution Planning Program, *Air pollution control agencies.

A report is prepared for the purpose of presenting guideline information which will assist the user in detailing the needs and requirements of a statewide air pollution control technical services system stressing laboratory operations. A number of appropriate State, regional and local agencies were visited. Their individual situations and operational programs were compiled into 'case histories' which formed the data base utilized in this effort. These data were then analyzed and the subsequent evaluations used to assist in documenting a significant number of elements or factors which will, in a given situation, influence the organization of a statewide laboratory system. This document provides guidelines for operating in the areas of organization, management, program element definition, legal considerations, technical functions, and quality control. (Author)

PB-214 184/4
Sperry Rand Research Center, Sudbury, Mass.
THERMASONDE DATA PROCESSING TECHNIQUES.
Final rept., 9 Oct 70-9 Feb 72,
W. D. Mount, A. C. Anway, B. R. Fow, C. M. Maloy, and C. V. Wick. Oct 72, 114p SRRC-CR-72-5 EPA-R3-72-022
Contract EPA-71-26

Descriptors: (*Radiometers, Data processing), (*Atmospheric sounding, Temperature measurement), Remote sensing, Temperature inversions, Air pollution, Statistical analysis, Antenna radiation patterns, Computerized simulation.
Identifiers: *Atmospheric temperature, Radiometric thermasondes.

A study was conducted in which three data processing techniques developed under the previous contract were refined and tested on a small sample of simulated and observed radiometric data. The results were compared and the input data and computer and manpower requirements for operational use of each technique were assessed. The report is organized as follows: Section 2 is devoted to the simulation discrepancy. Participation in the various field experiments is described, and the significant results leading to establishment of the discrepancy are presented. The present state of the art for the simulating the observed antenna temperatures and the impact of this capability upon system performance is discussed. Section 3 describes the data processing techniques. Specific work preformed in developing each technique is discussed, results are presented, and hardware and software requirements to implement each technique are indicated. Section 4 discusses the effects of a non-ideal antenna pattern, with a detailed description of a method of formulating the analysis of these effects. Section 5 contains the conclusions derived from this work and their implications. (Author)

PB-214 186/9
National Center for Voluntary Action, Washington, D.C.
ENVIRONMENTAL VOLUNTEERS IN AMERICA. FINDINGS AND RECOMMENDATIONS OF THE STEERING COMMITTEE OF THE NATIONAL CENTER FOR VOLUNTARY ACTION'S ENVIRONMENTAL PROJECT.
Final rept.,
Clem L. Zinger, Richard Dalsemer, and Helen Magargle. Oct 72, 643p* EPA-R5-73-011
Contract EPA-R-801243

Descriptors: (*Pollution, *Organizations), Air pollution, Water pollution, Public law, Attitudes, Profiles, Conservation, National government, State government.
Identifiers: *Volunteers.

The report presents the conclusion of a nine-month examination of the voluntary segment of the environmental movement. The report has three major foci: Identification of the operational and organizational problems of voluntary, environmentally interested organizations; Examination of the interaction of environmentally concerned groups and individuals with various governmental agencies (with emphasis on EPA); and The development of recommendations concerning ways in which various private and public entities can facilitate effective involvement of volunteers in environmental issues and activities. (Author)

PB-214 206/5
Federal Water Quality Administration, Washington, D.C.
DEVELOPMENT OF A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE RED RIVER OF THE NORTH, SOURIS, AND RAINY RIVER BASINS.

1972, 16p

Descriptors: (*Minnesota, *Water quality), (*North Dakota, Water quality), River basin development, Red River of the North, Souris River basin, Rainy River basin, Water quality, Water pollution.

The report describes a planned survey of the Red River of the North, Souris, Rainy River Basins draining the northern and eastern portions of North Dakota, and western and northern portions of Minnesota. Briefly described are the projects plans to study river inventories, economic and population studies, stream dynamics, and water quality management.

PB-214 240/5
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
DEVELOPMENT AND APPLICATION OF TUNABLE DIODE LASERS TO THE DETECTION AND QUANTITATIVE EVALUATION OF POLLUTANT GASES.
Final technical rept.,
E. David Hinkley, and J. O. Sample. 31 Mar 72, 65p EPA-R2-72-090
Contract F19628-70-C-0230

Descriptors: (*Air pollution, Gas analysis), (*Semiconductor lasers, *Gas detectors), (*Sulfur dioxide, *Gas analysis), Monitors, Infrared lasers, Infrared spectroscopy, Lead inorganic compounds, Tin inorganic compounds, Lead tellurides, Tin tellurides, Absorption spectra, Remote sensing, Heterodyning, Molecular energy levels.
Identifiers: *Laser spectroscopy, Tunable lasers, *Air pollution detection.

Results are presented of a program concerned with the development of tunable semi conductor diode lasers and their potential application toward solving some of the air pollution monitoring problems. The tunable diode lasers developed under the program are described. Information is given concerning some of the spectroscopic information obtained form the laser scans of portions of the gamma 1 band of SO2 between 1100 and 1200/cm, with special attention to comparison between experiment and theory. Initial experiments confirming the theory for remoter heterodyne detection are described. Next, experiments are discussed which relate to potential monitoring applications. The use of the first and second derivative techniques in point-sampling applications is compared, and an experiment showing present limits of detectability is described. Preliminary studies of interference effects, temperature and long-path transmission of diode radiation are also included.

PB-214 260/2
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
DESIGN, CONSTRUCTION, AND PRELIMINARY COMBUSTION TRIALS OF A RIG TO EVALUATE RESIDUAL FUEL-OIL/WATER EMULSIONS.
Summary rept.,
R. E. Barrett, H. R. Hazard, C. McComis, and D. W. Locklin. 15 Jul 70, 51p PH-86-68-84-22

Contract PH-86-68-84

Descriptors: (*Test facilities, Combustion), (*Combustion, *Residual oils), (*Air pollution, Combustion products), Emulsions, Water, Atomizing, Fuel oil, Oil burners, Design, Nitrogen oxides, Tests, Furnaces.
Identifiers: Air pollution control, Smoke number.

The report describes the design and development of a versatile combustion-test rig for investigating combustion of residual fuel oils at conditions simulating either the residence time or turbulence level of combustion in industrial boilers. The rig was designed to permit adjustment of the following factors: excess air, firing rate, combustion-air swirl, atomization-nozzle type, atomization temperature, fuel, and wall temperatures (with cooling surface added). Successful operation of the rig was achieved at firing rates of about 1.8 and 7.0 gph with No. 6 residual fuel oil and a 20 percent water-in-residual fuel oil emulsion. Smoke numbers (Bacharach) are reported for a number of combustion trials at 2 to 30 percent excess air. Preliminary measurements are given for NO (x) concentrations.

PB-214 261/0
Argonne National Lab., Ill.
SUMMARY OF RECENT TECHNICAL INFORMATION CONCERNING THERMAL DISCHARGES IN TO LAKE MICHIGAN.
Contract rept.

Aug 72, 142p* EPA/V-CR72-1

Descriptors: (*Lake Michigan, *Water pollution), (*Electric power plants, Water pollution), Heat, Temperature gradients, Fresh water biology, Ecology, Industrial wastes, Fresh water fishes, Plankton, Benthos, Plumes, Hydraulic models, Thermal power plants, Cooling water, Nuclear power plants.
Identifiers: *Thermal pollution, Periphyton, Water pollution effects (Plants), Water pollution effects (Animals).

The report is a review of new technical information, relevant to the environmental effects of thermal discharges into Lake Michigan, which is not reflected in the existing record of the Lake Michigan Enforcement Conference. Most of these discharges are from electric power plants. The report discusses separately the physical and biological aspects of thermal discharges. It includes descriptions of preoperational field studies, thermal-bar measurements, field measurements of the physical and biological characteristics of thermal discharges, mathematical modeling techniques, laboratory tests on biological effects of heated water, intake and outfall designs, power plant operational data, analyses of environmental effects and cost estimates of closed-cycle cooling systems, and chemical discharges from both fossil and nuclear power plants. The authors specifically refrained from drawing conclusions from the material. (Author)

PB-214 264-T
American Inst. of Crop Ecology, Silver Spring, Md.
AMERICAN INSTITUTE OF CROP ECOLOGY (AICE) SURVEY OF USSR AIR POLLUTION LITERATURE. VOLUME XIX. ENVIRONMENTAL POLLUTION WITH SPECIAL REFERENCE TO AIR POLLUTANTS AND TO SOME OF THEIR BIOLOGICAL EFFECTS,
M. Y. Nuttonson. Jan 73, 132p AICE-AIR-73-19 APTD-1366
Contract EPA-R-800878
See also Volume 18, PB-212 736.

Descriptors: (*Air pollution, *Periodicals), (*USSR, Air pollution), (*Electric power plants, Air pollution), (*Toxicology, Air pollution), Translations, Industrial wastes, Iron and steel industry, Combustion products, Waste disposal, Ammonia, Butyric acid, Ozone, Stratosphere, Carbon monoxide poisoning, Sulfur, Particles, Public health, Sulfur dioxide, Phenols, Reflexes, Psychophysiology, Industrial medicine, Epichlorohydrin.
Identifiers: *Air pollution effects (Animals), Indoor air pollution, Permissible dosage, Styrene/metyl.

The document consists of a collection of papers which relate some aspects of man's impact on the sanitary conditions of his physical environment. A number of the papers in the present volume deal with surveys of sources of air pollution, concentrations of various air pollutants, the measures aimed at improving the sanitary conditions in the air reservoir through preventive legislative actions of organizational as well as of technical character adopted in the USSR, and the nature of investigations conducted at a network of the sanitary-epidemiological stations, and laboratories of the country. Other papers in this volume represents reports of experimental and field studies.

PB-214 400/4
Earth Satellite Corp., Washington, D.C.
A FEASIBILITY DEMONSTRATION OF AN AERIAL SURVEILLANCE SPILL PREVENTION SYSTEM.
Water pollution control research series,
Robin I. Welch, Allan D. Marmelstein, and Paul M. Maughan. Jan 72, 125p EPA-15080-HOL-01/72
Contract EPA-68-01-0145
Paper copy available from GPO $2.00 as EP1.16:15080HOL-01/72.

Descriptors: (*Water pollution, *Aerial photography), (*Remote sensing, Water pollution), Oils, Hazardous materials, San Francisco Bay, Accident prevention, Abatement, Infrared detection, Sources, Photointerpretation, Air surveillance, Color photography.
Identifiers: *Water pollution detection, *Oil pollution detection, Oil spills.

Acquisition and interpretation of multispectral aerial photography and thermal infrared imagery was performed to evaluate remote sensing applications to oil and other hazardous materials spill prevention surveillance. The San Francisco Bay area was used as a test site, with major sub-areas delineated which contained facilities and activities which might lead to spills of oil and other hazardous substances into waterways. Results demonstrated that high quality, small scale (1/40,000 to 1/60,000) color infrared photography can be used for regional surveillance leading to classification of land use into areas where potential spill sources exist. High quality, large scale (1/5,000 to 1/10,000) color aerial photography can be used for localized delineation of potential spill sources. Recommendations are given for an operational spill surveillance system using multi-scale aerial photography obtained on a 9-inch format. Use of thermal infrared imagery is not indicated at this time.

PB-214 402/0
Illinois State Water Survey, Urbana.
STORM SEWER DESIGN. AN EVALUATION OF THE RRL METHOD.
Environmental protection technology series,
John B. Stall, and Michael L. Terstriep. Oct 72, 78p EPA-R2-72-068
Paper copy available from GPO $1.25 as EP1.23/2:72-068.

Descriptors: (*Storm severs, Design), Drainage, Urban areas, Watersheds, Surface water runoff, Rainfall, Computation, Flow control.
Identifiers: Rainfall runoff relationships.

Storm rainfall and runoff data were assembled from 10 urban basins in the U.S.A. ranging in size from 14 acres to 8 sq mi. The British RRL method of storm drainage design was applied to the 10 basins. The RRL method considers the urban basin to be comprised of the paved area of the basin which is directly connected to the artificial storm drainage system. In 3 of the 10 basins the RRL procedure was deemed to be appropriate and suitable for the design of a storm drainage system within the normal range of frequency of design rainfall events, from 2 to 20-year events. For greater storms and for certain cases within this frequency range, the RRL method breaks down because the runoff coming from the grassed area of the basin is significant. (Author)

PB-214 407/9
National Field Investigations Center-Denver, Colo.
REMOTE SENSING STUDY OF THERMAL DISCHARGES TO LAKE MICHIGAN. ILLINOIS-INDIANA-MICHIGAN.

Oct 72, 49p
See also PB-214 503.

Descriptors: (*Water pollution, Heat), (*Lake Michigan, Water pollution), (*Electric power plants, Water pollution), Michigan, Illinois, Indiana, Law enforcement, Aerial photography, Infrared scanners, Remote sensing.
Identifiers: *Thermal pollution, Water pollution detection.

An aerial reconnaissance study was conducted along the shoreline of Lake Michigan from South Haven, Michigan in a clockwise manner through Waukegan, Illinois. The flights were carried out during the afternoon hours on 17 October 1972 and 19 October 1972. The purpose was to document thermal discharges from electric power plants and to see if they were complying with the Lake Michigan Enforcement Conference. It was concluded that the recommendations were not being fulfilled by many sources of thermal and industrial discharges.

PB-214 408/7
URS Research Co., San Mateo, Calif.
WATER POLLUTION ASPECTS OF STREET SURFACE CONTAMINANTS.
Environmental protection technology series,
James D. Sartor, and Gail B. Boyd. Nov 72, 242p* EPA-R2-72-08
Contract DI-14-12-921
Paper copy available from GPO $3.00 as EP1.23/2:72-081.

Descriptors: (*Urban areas, Surface water runoff), (*Water pollution, *Surface water runoff), (*Streets, Surface water runoff), Refuse, Sources, Urban planning, Cleaning, Land use, Water analysis, Biochemical oxygen demand, Particles, Metals, Inventories, Pesticides.
Identifiers: *Storm water runoff.

Materials which commonly reside on street surfaces have been found to contribute substantially to urban pollution when washed into receiving waters by storm runoff. Calculations based on a hypothetical but typical U.S. city indicated that the runoff from the first hour of a moderate-to-heavy storm would contribute considerably more pollutional load than would the same city's sanitary sewage during the same period of time. The study provides a basis for evaluating the significance of this source of water pollution and provides information for communities having a broad range of sizes, geographical locales, and public works practices. Information was developed for major land-use areas within the cities. The analysis of the runoff is also reported.

PB-214 409/5
Environmental Protection Agency, Washington, D.C.
A PRESSURE SEWER SYSTEM DEMONSTRATION.
Environmental protection technology series,
Italo G. Carcich, Leo J. Hetling, and R. Paul Farrell. Nov 72, 225p* EPA-R2-72-091

Paper copy available from GPO $2.75 as stock no. EP1.23/2:72-091.

Descriptors: (*Sewers, Pumps), (*Pumps, *Sewage), Performance evaluation, Sanitary engineering, Hydraulic engineering, Flow rate, Greases, Pumping, Grinding (Comminution), Residential buildings.
Identifiers: Pressure sewers, Grinder pumps.

An extensive accumulation of data on pressure sewers and the Grinder Pump (GP) Unit has been presented and summarized. The grinder pump is simply a pump which grinds household sewage and pumps it into the sewer. It has special application to hilly areas where conventional gravity sewers are difficult to install. The report discusses the results of a field demonstration of grinder pump units in Albany, New York. Pressures, water usage, operating time, overflow occurrences, total number of operations, simultaneous operations were recorded. The effectiveness of small, nonmetallic pipes transporting the macerated wastewater under pressure was also successfully demonstrated. Grease accumulation did occur. Extensive chemical sampling proved that the pressure sewer waste was 100% stronger but contained 50% less contaminants on a gm/capita/day basis.

PB-214 410/3
Iowa State Univ., Ames. Dept. of Agricultural Engineering.
BIBLIOGRAPHY OF LIVESTOCK WASTE MANAGEMENT,
J. Ronald Miner, Dwaine Bundy, and Gerald Christenbury. Dec 72, 148p* EPA-R2-72-101
Paper copy available GPO $2.00 as EP1.23/2:72-101.

Descriptors: (*Agricultural wastes, *Bibliographies), (*Livestock, Agricultural wastes), (*Industrial waste treatment, Agricultural wastes), (*Water pollution, Agricultural wastes), Sheep, Swine, Beef cattle, Air pollution, Poultry, Hog houses, Byproducts, Waste disposal, Composts, Odor control, Cost estimates, Fertilizers, Groundwater, Nutrients, Surface water runoff.
Identifiers: *Water pollution control, Manure, *Feedlot wastes.

Livestock waste management research literature has expanded rapidly. The bibliography makes sources of information on this research available to the researcher, designer, regulatory official and others interested in the latest developments in animal waste handling, treatment, disposal or reuse. Included in the bibliography are references which include title, author, keywords and source data for 241 journal papers, 425 papers published as conference proceedings, 114 university or government publications, 71 magazine articles, 26 books or book chapters, 15 unpublished papers, and 53 academic theses.

PB-214 411/1
Franklin Inst. Research Labs., Philadelphia, Pa.
SELECTED URBAN STORM WATER RUNOFF ABSTRACTS JULY 1971-JUNE 1972,
Dorothy A. Sandoski, and Darwin R. Wright. Dec 72, 99p* EPA-R2-72-127
Contract EPA-68-01-0161
Paper copy available from GPO $1.50 as ED1.23/2:72-127.

Descriptors: (*Surface water runoff, *Bibliographies), (*Water pollution, Surface water runoff), (*Urban areas, Surface water runoff), Rainfall, Storm sewers, Overflows, Sewage treatment, Combined sewers, Surface drainage, Water quality, Legislation, Water storage, Snow removal, Flood control, Abstracts.
Identifiers: *Storm water runoff, Urban hydrology.

The July 1971 - June 1972 supplement to SELECTED URBAN STORM WATER RUNOFF ABSTRACTS is a compilation of 215 abstracts summarizing articles from a variety of technical literature and conferences, both domestic and foreign, primarily related to the problems of urban runoff caused by storm water discharges, combined sewer overflows, and nonsewered urban runoff. All aspects related to this topic fall under the selective areas of: design criteria and construction materials for sewers or apparatus employed in the flow of combined sewage and/or storm runoff; regulation devices for overflow or infiltration from urban runoff of storm water, combined sewage, or highway-salt runoff which can cause water pollution; water quality, legislation, or treatment methods based on problems caused from storm water; and, current tunnel technology and equipment used in the construction of sewer tunnels. (Author)

PB-214 417/8
Environmental Protection Agency, Washington, D.C. Water Quality Office.
REPORT ON THE QUALITY OF THE WATER OF THE LITTLE MIAMI RIVER AND TRIBUTARIES, OHIO,
C. E. Runas, L. P. Parrish, and L. A. Resi. Jan 71, 111p

Descriptors: (*Little Miami River Basin, *Water quality), (*Ohio, Water quality), Water pollution, pH, Dissolved gases, Oxygen, Nutrients, Coliform bacteria, Benthos.

The report gives the quality of the water of the Little Miami River Basin located in Ohio. Air and water temperature, pH, and dissolved oxygen were determined in the field. Samples were collected and returned to the laboratory for analyses of nutrients (nitrogen and phosphorus), coliform bacteria, and biological examinations. Benthic organisms were collected.

PB-214 418/6
Pacific Northwest Water Lab., Corvallis, Oreg.
PROCEEDINGS OF NATIONAL SYMPOSIUM ON FOOD PROCESSING WASTES (3RD), HELD AT NEW ORLEANS, LOUISIANA ON 28-30 MARCH 1972.
Environmental Protection Technology series.
Nov 72, 495p EPA-12060-08/72, EPA-R2-72-018
Report on National Waste Treatment Research Program.
Paper copy available from GPO $5.25 as EP1.23/2:72-018.

Descriptors: (*Food processing, *Industrial waste treatment), Meetings, Peeling, Agricultural wastes, Trickling filtration, Flotation, Fruits, Peaches, Sweet potatoes, Potatoes, Dairy products, Lagoons (Ponds), Aquaculture, Seafood.
Identifiers: *Water pollution control, Dry caustic peeling, Blanching, Potato processing, Whey, Fish processing, Sugar beet processing, Brewing industry, Paunch, Fruit processing, Ice cream, Biological industrial waste treatment.

The reports presented at the proceedings are given. They include the following: Report on first commercial evaluation of dry caustic peeling of clingstone peaches; Reduced waste generation by alternate vegetable blanching systems; A field study on the application of individual quick blanching; Waste control in the processing of sweet potatoes; RBC treatment of simulated potato processing wastes; Treatment of soy whey by membrane processes; Full-scale anaerobic trickling filter evaluation; Ice cream wastewater characterization and treatability; The use of chemical treatment and air flotation for the clarification of fish processing plant waste water; Tertiary treatment of combined domestic and industrial wastes; Ocean assimilation of food residuals; Process design for treatment of corn wet milling wastes; Separation, dewatering and disposal of sugarbeet transport water solids; Winery wastewater treatment; Treatment of cheese processing wastewaters in aerated lagoons; Characterization and treatment of brewery wastes; Cattle paunch contents as fish feed supplement; Characterization of fruit and vegetable processing wastewaters; Seafoods processing wastewater characterization.

PB-214 419/4
Meloy Labs., Inc., Springfield, Va.
RESTORATION OF BEACHES CONTAMINATED BY OIL,
Garth D. Gumtz. Sep 72, 129p* EPA-R2-72-045
Contract EPA-14-12-809
Paper copy available from GPO $3.50 as stock no. EP1.23/2:72-045.

Descriptors: (*Beaches, *Cleaning), (*Water pollution, Oils), Mobile equipment, Design, Sands, Feeding (Supplying), Separators, Process variables, Flotation, Performance evaluation, Cost estimates.
Identifiers: *Oil pollution removal, *Froth flotation, Oil water separators.

Based on laboratory studies, a 30 ton per hour pilot plant was built for cleaning oil contaminated beach sands. The plant utilized the principle of froth flotation. Extensive field testing considered different oils, feed concentrations, both brackish and sea water, and a range of processing conditions. These varied from nominal runs with sand feed rates of 30 tons per hour and oil concentrations of 0.5% to oil/water separations at high capacity. Using the test results, a mobile unit was designed, constructed, and field tested. Data was obtained on the effects on cleaning efficiency of relevant process parameters. The mobile unit operated successfully under a wide range of conditions. These tests and design are presented.

PB-214 440/0
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
SUMMARIES OF SOLID WASTE INTRAMURAL RESEARCH AND DEVELOPMENT PROJECTS,
Andrew W. Breidenbach. 1971, 30p EPA-SW-14r
Paper copy available from GPO $0.35 as EP3.2:R31.

Descriptors: (*Waste disposal, Research), Composts, Hazards, Grinders, Incinerators, Public health, Materials recovery, Earth fills.
Identifiers: *Solid waste disposal, Ocean waste disposal, Pathogens, Sanitary landfills.

The Federal research and development attack on solid waste management problems employs a variety of approaches, not the least of which are intramural undertakings. The report summarizes the approaches and progress associated with projects being pursued on an intramural basis. The research topics briefly described involve the following: Composting; Dangers and hazards; Grinders; Incinerators; Laboratory analysis; Marine disposal; Pathogens; Reclamation and reuse; Sanitary landfill; and, Characterization of Solid wastes.

PB-214 441/8
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
STATE SOLID WASTE PLANNING GRANTS, AGENCIES, AND PROGRESS--1970. REPORT OF ACTIVITIES THROUGH JUNE 30, 1970,
Richard O. Toftner, Daniel D. Swavely, William T. Dehn, and Beula L. Sweeney. 1971, 32p EPA-SW-41ts
Also available as Public Health Service Publication No. 2109.

Descriptors: (*Waste disposal, *Grants), State government, Inventories, Project planning.
Identifiers: Government agencies, *Solid waste disposal.

To date, 41 States, the District of Columbia, Puerto Rico, Guam, and 5 interstate agencies have

been approved to receive solid waste planning grants. Even the States without them have, however, conformed to the first prerequisite specified in the Act. This calls for the designation of a single State agency to conduct solid waste planning for the State. This publication lists the names and addresses of the solid waste planning agencies for all States, Territories, and the District of Columbia. It also gives project description information for the State and interstate agencies with solid waste planning grants. (Author)

PB-214 448/3
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
INTERGOVERNMENTAL APPROACHES TO SOLID WASTE MANAGEMENT,
Richard O. Toftner, and Robert M. Clark. 1971, 22p EPA-SW-47ts
Paper copy available from GPO $0.30 as EP3.2:1N8.

Descriptors: (*Waste disposal, *Regional planning), Organizing, Urban planning, Local government, State government.
Identifiers: *Solid waste disposal, Intergovernmental relations.

Since passage of the original Solid Waste Disposal Act (Public Law 89-272, Title II) in October 1965, there has been considerable discussion about what organizational form a solid waste management system should take. The purpose of the following paper was to examine the basic organizational requirements of solid waste management systems and then relate them to the intergovernmental coordination mechanisms that are available for fulfilling such requirements within regional configurations. The primary objective was to outline an 'integrated management system' that includes planning, organization, operations, and control on a rational regional basis.

PB-214 454/1
Culligan International Co., Northbrook, Ill.
ACID MINE DRAINAGE TREATMENT BY ION EXCHANGE.
Environmental protection technology series,
J. G. Holmes, and E. G. Kreusch. Nov 72, 211p EPA-R2-72-056
Contract DI-14-12-887
Paper copy available from GPO $2.75 as EP1.23/2:72-056.

Descriptors: (*Mine waters, *Ion exchanging), (*Water treatment, Mine waters), Cation exchanging, Anion exchanging, Regeneration (Engineering), Potable water, Design, Industrial plants, Cost estimates, Performance evaluation, Process charting, Water pollution.
Identifiers: *Mine acid drainage, *Water pollution control.

In areas where acid mine drainage has diminished the available water supplies, processes which are capable of producing potable water from this drainage are of interest. Ion exchange processes have this capability. The investigation was intended to study several conventional ion exchange processes, using commercially available materials and to determine if any of these processes could be used to produce potable water from acid mine drainage. The three best systems were found to be: Strong acid cation exchanger regenerated with sulfuric acid; Weak base anion exchanger regenerated with caustic soda; and Weak base anion exchanger regenerated with sodium hydroxide and carbon dioxide (modified Desal process). Treatment plants in three sizes were designed for each system so that cost estimates could be established.

PB-214 455/8
NUS Corp., Pittsburgh, Pa. Cyrus Wm. Rice Div.
OXIDATION OF PYRITES IN CHLORINATED SOLVENTS.
Environmental protection technology series,
Joseph A. Boros, Donald R. Brenneman, and Joseph C. Troy. Nov 72, 54p EPA-R2-72-069
Paper copy available from GPO $1.00 as EP1.23/2:72-069.

Descriptors: (*Pyrite, *Chlorination), (*Hydrometallurgy, Pyrite), (*Oxidation, Pyrite), Spoil, Oxygen, Coal mines, Water pollution control, Sulfide minerals, Iron ores, Mine waters, Chlorine, Regeneration (Engineering), Organic solvents, Chlorine aliphatic compounds, Ultraviolet radiation, Reaction kinetics, Iron chlorides.
Identifiers: *Water pollution control, Mine wastes.

The purpose of the study was to develop methods for extracting sulfur and iron compounds from pyritic waste materials, producing a final refuse that is incapable of causing water pollution, and at the same time, conserving useful mineral resources. The primary method under investigation was the chlorination of pyrites in non-aqueous solvents. An attractive feature of the proposed method was its cyclic nature. Test results indicated that the successful extraction of sulfur and iron compounds depended upon the continuous addition of chlorine gas to the system. The expected replacement of chlorine by ferric chloride and sulfur dichloride was not achieved under conditions of the study. Recycling solvents through beds of pyrite, elevated temperatures, and treatment in ultra-violet radiation yielded slight improvements in reaction rate.

PB-214 457/4
Washington Univ., Seattle. Dept. of Civil Engineering.
CORRELATED STUDIES OF VANCOUVER LAKE - WATER QUALITY PREDICTION STUDY.
Environmental Protection Technology series,
Surinder K. Bhagat, William H. Funk, and Donald L. Johnstone. Nov 72, 120p EPA-R2-72-111
Paper copy available from GPO $2.00 as EP1.23/2:72-111.

Descriptors: (*Lakes, Reclamation), (*Vancouver Lake, *Water pollution), (*Water quality, Mathematical models), Columbia River, Sediments, Hydrology, Coliform bacteria, Algae, Nutrients, Seasonal variations, Predictions, Dissolved gases, Oxygen, Computer programs, Runge-Kutta method, Limnology, Flushing.
Identifiers: Eutrophication.

The study deals with the restoration of water quality of shallow, polluted, and eutrophic lakes. Dredging and removing of lake bottom sediments and introducing better quality water are the restoration measures explored. Vancouver Lake, Washington, was used as a test case. Hydrologic, hydrographic, hydrodynamic, and water quality information, provided by separate but correlated studies, was combined with the aid of mathematical simulation models. Dissolved oxygen (DO) was used as an indicator of the overall water quality in the system. In addition to the DO model, the aquatic life model for computing time-varying levels of phytoplankton and bacteria was also tried. The validity of these models was verified with the actual field data. After verifications of the models under the existing conditions, they were used to project and predict the water quality of Vancouver Lake as will be affected by dredged lake depths and introduced flows from the Columbia River.

PB-214 458/2
NUS Corp., Pittsburgh, Pa. Cyrus Wm. Rice Div.
REVEGETATION AUGMENTATION BY REUSE OF TREATED ACTIVE SURFACE MINE DRAINAGE: A FEASIBILITY STUDY.
Environmental protection technology series,
Frank J. Zaval, and John D. Robins. Nov 72, 155p EPA-R2-72-119
Prepared in cooperation with Kentucky Dept. of Natural Resources. Lexington.
Paper copy available from GPO $2.00 as EP1.23/2:72-119.

Descriptors: (*Mine waters, *Irrigation), (*Spoil, Irrigation), (*Water reclamation, Mine waters), Neutralizing, Feasibility, Nutrients, Plant growth, Spraying, Cost estimates, Water pollution, Calcium oxides, Water analysis, Coal mines, Strip mining.
Identifiers: *Mine acid drainage, *Water pollution control, Strip mine wastes.

The objective of the study was to determine the feasibility of conducting a full-scale demonstration project on the use of neutralized acid mine drainage to irrigate new vegetative cover on regraded spoil banks. Determination of project feasibility was based upon the performance and results of the following investigative measures: waters of receiving streams and pit discharges were analyzed and evaluated for treatment; regraded spoil banks were sampled and analyzed for requirements necessary for vegetative survival; and weir structures, monitor enclosures and instruments were evaluated. Four irrigation techniques were evaluated before a high pressure spray system was selected as the most practical.

PB-214 468/1
Environmental Protection Agency, Kansas City, Mo. Region VII.
LABORATORY PROCEDURES. ANALYSIS FOR WASTEWATER TREATMENT PLANT OPERATORS,
David Vietti. Jun 71, 98p*

Descriptors: (*Sewage treatment, *Water analysis), (*Industrial waste treatment, Water analysis), Handbooks, Laboratory equipment, Tests, Dissolved gases, Oxygen, Particles, Suspended sediments, Sludge, Hydrogen sulfide, Carbon dioxide, Phosphorus, Nitrogen, Oils, pH, Bacteria.

The wastewater laboratory manual is furnished by the Environmental Protection Agency as an aid to the laboratory analyst for making wastewater analyses. It is not meant to be the ultimate answer for the most precise and accurate tests. However, the procedures contained herein for the most widely used parameters in a treatment plant are of the highest precision. After briefly summarizing laboratory techniques and equipment, the report presents over 40 tests such as for oxygen, nitrogen, sludge volume, pH, bacteria, etc.

PB-214 469/9
American Public Works Association, Chicago, Ill. Research Foundation.
PROBLEMS OF COMBINED SEWER FACILITIES AND OVERFLOWS: 1967.
Water pollution control research series.
1 Dec 67, 209p WP-20-11, FWPCA-11020-12/67
Grant DI-14-12-65
Paper copy available from GPO $1.00 as I67.13/3:11; WP-20-11.

Descriptors: (*Combined sewers, *Overflows), Surveys, Storm sewers, Inventories, United States, Tables (Data), Water pollution, Land use, Cost estimates, Urban areas.
Identifiers: *Water pollution control.

The effects and means of correcting combined sewer overflows and separate storm and sanitary sewer discharges were inventoried on a national basis in 1967 and compiled. On-site personal interviews with the public officials of approximately 900 communities in the United States collected over 250,000 pieces of data which have been analysed and grouped by State, river basin, and population group to define the problems of combined sewer facilities and overflows. Nationwide projections were made for major items of interest including area and population served by combined sewers, overflow locations, type and number of regulators, associated land and water uses, estimates of costs for sewer separation by States, alternate control and/or treatment methods, and consideration of other aspects of the overall problem.

PB-214 474/9
Environmental Protection Agency, Washington, D.C.
MANUAL: GRANTS ADMINISTRATION.

7 Apr 72, 292p EPA-TN-5700.1
Paper copy available from GPO $13.50, as stock no. HE1.6/7 on Subscription only.

Descriptors: (*Grants, *Pollution), (*National government, Grants), Manuals, Government policies, Cost estimates, Financing, Accounting.
Identifiers: Environmental protection agency.

The policies presented in the manual govern the administration of all Environmental Protection Agency (EPA) grant activities. Specific policies and procedures for the various functional divisions are covered in the respective parts. The topics covered are: General policies and procedures; Application and initial evaluation; Grant conditions; Intergovernmental relations; Costs; Funding; Accounting, records retention, and audits; Reports; Modification, suspension and termination of grants; and Property management.

PB-214 498/8
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
NITROGEN REMOVAL TODAY,
J. F. Kreisal. 1971, 21p
Presented at the Wisconsin Univ., Madison, Sanitary Engineering Inst. 9-10 March 1971.

Descriptors: (*Chemical removal (Sewage treatment), *Nitrogen), (*Sewage treatment, Chemical removal (Sewage treatment)), (*Activated sludge process, Chemical removal (Sewage treatment)), Nutrients, Nitrification, Design, Reviews, Cost estimates, Ion exchanging, Chlorination.
Identifiers: Denitrification, Ammonia stripping.

A review of nitrogen removal techniques is presented. The most advanced methods are stressed with presentation of available operational, economic, and theoretical factors. Other methods are cited without detail. Nitrogen removal is put into context with other treatment requirements. (Author)

PB-214 503/5
National Field Investigations Center-Denver, Colo.
REMOTE SENSING STUDY OF THERMAL DISCHARGES TO LAKE MICHIGAN, WISCONSIN, ILLINOIS, INDIANA, AND MICHIGAN.

Sep 72, 77p
Presented at the Fourth Session of the Lake Michigan Enforcement Conference on 21 Sep 72. See also PB-214 407.

Descriptors: (*Lake Michigan, Water pollution), (*Water pollution, Heat), (*Electric power plants, Water pollution), Michigan, Indiana, Wisconsin, Illinois, Law enforcement, Aerial photography, Infrared scanners, Remote sensing.
Identifiers: *Thermal pollution, Water pollution detection.

An aerial reconnaissance study was conducted along pre-designated segments of the shoreline of Lake Michigan on September 14, 1972. The purpose of this remote sensing study was to document the extent of thermal discharges from the major electric power plants over the area extending from Muskegon, Michigan, to Twin Creeks, Wisconsin and to see if they are following the recommendations of the Lake Michigan Enforcement Conference. Nine of the ten plants covered were violating the recommended 3 F maximum temperature increase at the distance of 1,000 feet from an outfall. In addition, six of the power plants were also violating this permitted 3 F increase even at a distance of 2,000 feet from the plant discharge. It was also observed that the thermal plumes from some sources were overlapping. It was concluded that the recommendations of the Lake Michigan Enforcement Conference are not being met by many sources of thermal and industrial discharges within the Conference area.

PB-214 504/3
Environmental Protection Agency, Washington, D.C. Office of Water Programs.
INSTRUMENTAL ANALYSIS OF CHEMICAL POLLUTANTS. TRAINING MANUAL.

Apr 71, 294p*

Descriptors: (*Water analysis, *Manuals), (*Pesticides, Water analysis), Thin layer chromatography, Gas chromatography, Laboratory equipment, Spectroscopic analysis, Spectrochemical analysis, Chlorine organic compounds, Mass spectroscopy, Nuclear magnetic resonance, Errors, Phosphorus organic compounds, Soil analysis, Oils.
Identifiers: *Water pollution detection.

The manual was developed for use by students in training courses of the Water Quality Office, Environmental Protection Agency. The report discusses gas, liquid, and thin-layer chromatography, atomic and colorimetric spectral analysis, sampling methods, and instrument design. A special section for pesticide analysis of soil or water is also included.

PB-214 515/9
United Aircraft Research Labs., East Hartford, Conn.
AUTOMOTIVE GAS TURBINE OPTIMUM CONFIGURATION STUDY.
Final rept.,
E. S. Wright, L. E. Greenwald, and R. R. Titus.
May 72, 82p* UARL-L971249-7
Contract EPA-68-04-0013

Descriptors: (*Gas turbine engines, Optimization), (*Automobile engines, Gas turbine engines), Automotive engineering, Turbine components, Thermodynamic cycles, Design criteria, Economic analysis, Performance evaluation, Recommendations, Exhaust emissions, Air pollution control equipment.
Identifiers: Advanced automotive power systems.

A wide variety of candidate gas turbine cycles was evaluated for application to automobile propulsion. Simple cycles, regenerated and recuperated cycles, cycles including intercooling and reheat, single-shaft and free-turbine engines, and a combined gas turbine and Rankine cycle were evaluated over a range of pressure ratios and turbine inlet temperatures for an initial total of 60 separate candidate cycles. Following a preliminary evaluation on the basis of total lifetime costs of all designs, three leading candidates were chosen for more detailed analysis – a simple cycle, a regenerated cycle, and a recuperated cycle, all of which were single-shaft designs. (Author)

PB-214 516/7
Environmental Protection Agency, Washington, D.C. Office of Water Programs.
PLANNING, DEVELOPMENT AND MANAGEMENT OF WASTEWATER TREATMENT FACILITIES. TRAINING MANUAL.

Jul 71, 268p*

Descriptors: (*Sewage treatment, *Manuals), (*Industrial waste treatment, Manuals), Management planning, Design, Activated sludge process, Trickling filtration, Lagoons (Ponds), Sewers, Sewage filtration, Equipment, Sewage disposal, Safety, Maintenance.

The training manual covers the management, instrumentation, equipment, and processes used in a sewage treatment plant. Various processes such as activated sludge, trickling filtration, and tertiary treatment are described. Along with the techniques and equipment, various management practices are presented. These involve areas as safety, maintenance, and financing.

PB-214 517/5
Environmental Protection Agency, Washington, D.C. Office of Water Programs.
PHYSICAL-CHEMICAL TREATMENT TECHNOLOGY. TRAINING MANUAL.
Jan 72, 159p*

Descriptors: (*Sewage treatment, *Manuals), (*Industrial waste treatment, Manuals), Water pollution, Heat, Cooling towers, Flotation, Settling, Centrifugal separation, Oxidation, Ammonia, Dewatering, Sludge drying, Neutralizing, Combustion, Contacting.
Identifiers: *Physical chemical treatment, *Water pollution control, *Thermal pollution, Ammonia stripping, Sludge treatment.

The report describes various physical-chemical treatment techniques used in water pollution control. The manual is intended to familiarize personnel concerned with selection, design, operation, and evaluation of these procedures. Four areas are discussed: Thermal pollution (Sources, theory, and control); Solids liquid separation (Sedimentation, settling, flotation, etc.); Miscellaneous unit processes (Oxidation, ammonia removal, and neutralization); and Sludge dewatering and disposal.

PB-214 527/4
Garrett Corp., Los Angeles, Calif. AiResearch Mfg. Div.
CONDENSER AND FAN DEVELOPMENT FOR AUTOMOTIVE RANKINE CYCLE ENGINES.
Quarterly progress rept. 10 Nov 71-31 Jan 72,
D. W. Graumann. 18 Feb 72, 31p 72-8095 (1)
Contract EPA-68-01-0407

Descriptors: (*Automobile engines, Rankine cycle), (*Condensers (Liquefiers), Rankine cycle), (*Fans, Automobile engines), Design, Cooling fins, Condensing, Optimization, Installing, Fabrication, Ducts.

The goal of the present study is to develop preprototype condenser, duct, and fan packages for each of the three Rankine cycle automotive power plants now under development. The study will involve the further optimization of the air-side perforated fin, the measurement of condensing coefficients, the optimization of the cooling system installation, and the design, fabrication, and testing of the fans and condenser. (Author)

PB-214 531/6
Ayres, Lewis, Norris and May, Inc., Ann Arbor, Mich.
AMMONIA REMOVAL IN A PHYSICAL-CHEMICAL WASTEWATER TREATMENT PROCESS.
Environmental Protection Technology series,
Robert A. Barnes, Peter F. Atkins, Jr., and Dale A. Scherger. Nov 72, 68p* EPA-R2-72-123
Contract EPA-68-01-0049
Paper copy available from GPO $1.25 as EP1.23/2:72-123.

Descriptors: (*Chemical removal (Sewage treatment), *Ammonia), (*Sewage treatment, Chemical removal (Sewage treatment)), (*Chlorination, Ammonia), Amines, Pilot plants, Performance evaluation, Coagulation, Activated carbon treatment, Phosphorus, Nitrogen, Biochemical oxygen demand, Particles.
Identifiers: *Chloramines, *Physical chemical treatment, Dechlorination, Owosso (Michigan).

Discussed is a pilot scale study for ammonia removal at Owosso, Michigan, involving a physical-chemical wastewater treatment system consisting of chemical coagulation (lime to pH 8.8 to 9.4) sedimentation, deep bed filtration, carbon ad-

sorption, chlorination to oxidize ammonia, and carbon dechlorination to remove free chlorine and chloramines. Ammonia-nitrogen was removed to any desired level by the chlorination-dechlorination system. Complete removal would require a chlorine to ammonia feed ratio of 9 to 1. The dechlorination carbon removed free chlorine and also the chloramines formed at less-than-breakpoint operation. There is an initial ammonia-nitrogen breakthrough when using fresh dechlorination carbon which is attributed to acclimation rather than continuous leakage. An hypothesis describing chloramine removal is presented.

PB-214 536/5
Steam Engine Systems Corp., Newton, Mass.
WATER/RECIPROCATING EXPANDER SYSTEM, PRESENTED AT AUTOMOTIVE RANKINE CYCLE CONTRACTORS COORDINATION MEETING, JANUARY 20-21, 1972.

Jan 72, 39p*

Descriptors: (*Motor vehicle engines, *Rankine cycle), (*Automobiles, Motor vehicle engines), Steam engines, Boilers, Steam condensers, Motor vehicle drive systems, Lubrication systems, Design criteria, Performance evaluation.

Describes the structural parts of a steam engine system for automobile propulsion and presents the anticipated operating and performance parameters.

PB-214 550/6
Weston (Roy F.), Inc., West Chester, Pa.
DESIGN MANUAL FOR UPGRADING EXISTING WASTEWATER TREATMENT PLANTS,
P. Krishnan, and C. M. Mangan. Oct 71, 275p*
Contract DI-14-12-933
Paper copy available from Environmental Protection Agency, Washington, D.C. or Regional Offices, Free.

Descriptors: (*Sewage treatment, Upgrading), (*Manuals, Sewage treatment), Optimization, Design, Trickling filtration, Activated sludge process, Clarification, Aeration, Activated carbon treatment, Odor control, Disinfection, Chlorination, Sludge drying, Sludge digestion.
Identifiers: Sewage treatment plants.

The main purposes of the manual are to examine situations that necessitate upgrading of existing municipal wastewater treatment plants and to discuss and evaluate the corrective actions that are required to upgrade these existing plants. Upgrading to overcome organic and hydraulic overloadings and/or to meet more stringent treatment requirements is considered. The information presented is specifically adapted to plants having capacities of less than 5 mgd. The manual emphasizes that operational improvement and modifications to existing unit operations be considered as the logical initial approach to upgrading existing treatment plants. It examines in depth the capabilities, limitations, and interrelationships of the various unit processes. The operation and maintenance requirements of the upgraded treatment plants are also briefly examined.

PB-214 551/4
Burns and Roe, Inc., Oradell, N.J.
PROCESS DESIGN MANUAL FOR SUSPENDED SOLIDS REMOVAL.

Oct 71, 149p*
Contract DI-14-12-930
Paper copy available from Environmental Protection Agency, Washington, D.C. or Regional Offices. Free.

Descriptors: (*Sewage treatment, *Suspended sediments), (*Sewage filtration, *Manuals), Design, Coagulation, Precipitation (Chemistry), Filter aids, Diatomaceous earth, Flocculating, Settling, Cost estimates, Alums.
Identifiers: Microscreening.

The manual comprises a compilation of information on the practice of suspended solids removal from municipal wastewaters. General engineering considerations are cited with respect to their impact on the design of treatment facilities. Specific processes used for suspended solids removal are described, discussed and illustrated through the use of data from installations which have employed these processes. Current technology and advanced methods of treatment are stressed in order to provide usable information for implementation in design of new treatment facilities. Some aspects of the operation and maintenance requirements of the described unit processes are delineated, along with the overall estimated costs of construction and operation. The information and data provided are presented in such a manner that they can be readily incorporated into practice. (Author)

PB-214 552/2
Swindell-Dressler Co., Pittsburgh, Pa.
PROCESS DESIGN MANUAL FOR CARBON ABSORPTION.

Oct 71, 95p*
Contract DI-14-12-928
Paper copy available from Environmental Protection Agency, Washington, D.C. or Regional Offices. Free.

Descriptors: (*Activated carbon treatment, *Manuals), (*Sewage treatment, Activated carbon treatment), Dissolved organic matter, Regeneration (Engineering), Design, Cost engineering, Absorption, Air pollution.
Identifiers: Physical chemical treatment.

Carbon's great efficiency in organic removal has promoted its use for upgrading conventional plant performance. Successful use of carbon in tertiary treatment has led to proposals that it be used for secondary treatment as well, i.e., as a replacement for biological treatment. The manual examines major design parameters and unit operations (including pretreatment) which are important in carbon adsorption systems. Existing carbon plant designs are evaluated. Costs are evaluated for the various unit operations. Various plant configurations are discussed. Carbon regeneration (a prerequisite for economic feasibility) is discussed and the necessary equipment is described. Other aspects discussed include: air pollution control devices for the regeneration furnace, personnel requirements, isotherm and pilot testing, carbon dewatering, biodegradation of organics in carbon columns. (Author)

PB-214 553/0
Black and Veatch, Kansas City, Mo.
PROCESS DESIGN MANUAL FOR PHOSPHORUS REMOVAL.

Oct 71, 195p*
DI-14-12-936
Paper copy available from Environmental Protection Agency, Washington, D.C. or Regional Offices. Free.

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Sewage treatment, Chemical removal (Sewage treatment)), (*Manuals, Chemical removal (Sewage treatment)), Precipitation (Chemistry), Calcium oxides, Aluminates, Iron chlorides, Alums, Settling, Performance evaluation, Sludge disposal, Design, Activated sludge process, Cost estimates.

The manual discusses phosphorus removal methods that have been found effective and practical for use at wastewater treatment plants. All the methods included involve chemical precipitation of the phosphorus and removal of the resultant precipitate. Precipitants include salts of aluminum and iron, and lime. The practical points of addition are before the primary settler, in the aerator of an activated sludge plant, before the final settler, or in a tertiary process. Included in the discussion of each treatment method is a description of the method, pilot or full-scale performance data, equipment requirements, design parameters, and costs. This information should be of value to designers, municipal officials, regulatory agencies, city planners, and treatment plant operators. (Author)

PB-214 556/3
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Management Office.
SUMMARIES OF SOLID WASTE MANAGEMENT CONTRACTS, 1 JULY 1965-30 JUNE 1970,
Hugh H. Connolly. 1972, 85p EPA-SW-5.3 PHS-Pub-1897
Paper copy available from GPO $1.00 as stock no. 5502-0025.

Descriptors: (*Waste disposal, *Contracts), Grants, Research.
Identifiers: *Solid waste disposal.

The report is a compendium of contract projects supported by the Solid Waste Management Office (SWMO) and its predecessors since the passage of the Solid Waste Disposal Act of 1965. The purpose of the publication is to inform interested readers of the variety of contracts being supported in such a way that information developed from this activity can be made quickly available and disseminated to those persons who can best use the information. (Author)

PB-214 558/9
Environmental Protection Agency, Cincinnati, Ohio.
SOLID WASTE MANAGEMENT DEMONSTRATION GRANT PROJECTS - 1971. FOR GRANTS AWARDED DURING THE PERIOD 1 JUNE 1966-30 JUNE 1971,
Charles E. Sponagle, and Patricia L. Stump. 1971, 253p EPA-SW-3d.1 PHS-Pub-1821
Library of Congress Catalog Card no. 68-67030.
Paper copy available from GPO $2.00 as stock no. 5502-0050.

Descriptors: (*Waste disposal, *Grants), Research.
Identifiers: *Solid waste disposal.

Under the Solid Waste Disposal Act of 1965 (Title II, P.L. 89-272) and the broader mandate of the 1970 amendment (Resource Recovery Act, P.L. 91-512), public and nonprofit agencies can procure Federal aid to study or to test new approaches to solid waste management. The grant awards provide up to two-thirds of the total project costs. In the report are compiled summaries or abstracts of all demonstration grants that have been awarded since the beginning of the Federal solid waste management program.

PB-214 562/1
National Field Investigations Center-Denver, Colo.
THE IMPACT OF VARIOUS HEAVY METALS ON THE AQUATIC ENVIRONMENT.
Technical rept.,
Robert F. Schneider. 17 Feb 71, 26p TR-2

Descriptors: (*Water pollution, *Metals), (*Aquatic biology, Metals), (*Water quality, Metals), Public health, Standards, Arsenic, Copper, Cadmium, Lead, Zinc, Potable water, State government, Toxicology.
Identifiers: *Water pollution standards, Synergism.

A literature review of the effects of arsenic, copper, cadmium, lead and zinc species on water

quality and aquatic biota is presented. Some synergistic and antagonistic effects are discussed and the existing governmental standards for these metals are summarized. (Author)

PB-214 563/9
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
PHYSICAL-CHEMICAL NITROGEN REMOVAL FROM MUNICIPAL WASTEWATER,
Alan F. Cassel, Thomas A. Pressley, Walter W. Schuk, and Dolloff F. Bishop. Mar 71, 29p

Descriptors: (*Chemical removal (Sewage treatment), *Ammonia), (*Sewage treatment, Chemical removal (Sewage treatment)), Chlorination, Ion exchanging, Performance evaluation, Pilot plants, Nitrogen.
Identifiers: *Physical chemical treatment, Clinoptilolite, Zeolites.

Selective ion exchange for ammonia removal, using the natural zeolite, clinoptilolite, was applied to lime clarified and filtered raw wastewater both before and after carbon adsorption. Intermittant operation of the ion exchange unit with minimum operator surveillance produced an average of 75% removal of NH3-N over a 10 month period. Breakpoint chlorination for ammonia removal was also studied by applying it to filtered secondary effluent and to selective ion exchange effluent. Chlorination of filtered secondary effluent in an agitated reactor removed essentially all the NH3-N with 95% conversion to N2 gas. Process variables are discussed.

PB-214 564/7
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
ACTIVATED SLUDGE TREATMENT WITH OXYGEN,
John B. Stamberg, Dolloff F. Bishop, and Gordon Kumke. Mar 71, 31p

Descriptors: (*Activated sludge process, *Oxygenation), (*Sewage treatment, Activated sludge process), Design, Performance evaluation, Oxygen, Pilot plants, Clarification, Chemical removal (Sewage treatment), Mixing, Nitrogen, Phosphorus, Dissolved organic matter.

The report discusses the use of pure oxygen in an activated sludge sewage treatment system. It produces effluents comparable in BOD and suspended solids to those of a parallel diffused aeration system with an aeration time of 3.6 hours. Consistently over 95% of the supplied oxygen was used in the reactor which employed co-current liquid and gas flow contacting. The microbial organisms visually were found to be essentially the same as a typical conventional system; however, their rate of activity was greater.

PB-214 565/4
Small Business Administration, Washington, D.C. Office of Planning, Research and Analysis.
SBA ECONOMIC REVIEW. VOLUME 5, NUMBER 2, FALL 1972.
Dec 72, 100p

Descriptors: (*Commerce, Economic surveys), Reviews, Economic factors, Research, Ethnic groups, Manufacturing.
Identifiers: Small Business Administration, Minority enterprises, Minority Enterprise Small Business Investment Company.

Contents:
- Small business in the economy 1971 to mid-year 1972;
- Survival and growth--two conferences for the small research and development firm;
- New SBA programs;
- An overview of the minority enterprise small business investiment company (MESBIC) program.
- Opportunities for small firms in manufacturing.

PB-214 580/3
Environmental Protection Agency, Washington, D.C. Water Quality Office.
STORAGE AND RETRIEVAL OF WATER QUALITY DATA. TRAINING MANUAL.

Apr 71, 303p

Descriptors: (*Water quality, *Data retrieval), (*Water pollution, Data retrieval), Machine coding, Data acquisition, Water analysis, Site surveys, Manuals, Education.
Identifiers: Management information systems.

STORET is the data storage and retrieval system developed by and for the EPA and is a system suitable to the needs of all users of water quality and water resource data. The contents of the report make up a course which is intended to provide information and instruction on the STORET system for those persons directly involved in accumulating, processing and using water data.

PB-214 593/6
Utah Univ., Salt Lake City.
REMOVAL OF DISSOLVED CONTAMINANTS FROM MINE DRAINAGE,
Jan D. Miller. Dec 72, 61p EPA-R2-72-130
Paper copy available from GPO $1.25 as EP1.23/2:72-130.

Descriptors: (*Mine waters, *Adsorption), (*Tailings, *Adsorbents), (*Water pollution, Mine waters), Metals, Tests, Iron, Copper, Zinc, pH.
Identifiers: *Mine acid drainage, *Water pollution control.

Eleven mill tailing samples from locations throughout the Rocky Mountain region were tested for their effectiveness in removal of dissolved contaminants from mine drainage. The average capacity of the tailings tested was 9.8 mg of iron per gram of tailing with a range of capacities from 6 mg/g to 15 mg/g. From these studies it was concluded that for almost all tailing samples, removal was accomplished mainly due to hydrolytic adsorption of metal ions with a small contribution due to the inherent basicity of the tailing. In the other case, removal occurred via reaction with calcareous components of the sample. Continuous column, or stationary bed tests, in the laboratory and in the field were not nearly as effective. It appears that for effective removal a stirred tank reactor will be required.

PB-214 605/8
Chemstrand Research Center, Inc., Durham, N.C.
HOLLOW FIBER TECHNOLOGY FOR ADVANCED WASTE TREATMENT.
Environmental Production Technology series,
J. D. Bashaw, J. K. Lawson, and T. A. Orofino.
Dec 72, 94p* EPA-R2-72-103
Contract DI-14-12-926
Paper copy also available from GPO $1.25 as EP1.23/2:72-103.

Descriptors: (*Sewage treatment, *Osmosis), Cellulose acetate, Membranes, Spinning (Extruding), Design, Fouling, Performance evaluation, Chemical removal (Sewage treatment).
Identifiers: *Hollow fiber membranes, *Reverse osmosis, Tertiary sewage treatment.

The utility of hollow fiber reverse osmosis membranes in renovation of secondary municipal effluent was investigated through construction, laboratory evaluation, and monitoring in field service of various hollow fiber modules. All units incorporated cellulose acetate hollow fibers, annealed for sodium chloride rejections of 80-95% at 250 psi external operating pressure. Product water capacities ranged from 50-300 gallons per day. Module designs considered included the single seal end, looped fiber bundle; double seal end, parallel bundle; radial flow parallel bundle; and a rolled, woven hollow fiber fabric. The typical flux-rejection characteristics of the basic fiber system (4 gfd-95%) were observed in waste water service, but steady-state flux, maintained only with regular detergent flushes, was usually less than 1 gfd, with an accompanying decline in selectivity. A notable exception was the woven hollow fiber fabric design, which showed improved retention of start-up characteristics and minimum effects of shell-side fouling during short-term field tests. (Author)

PB-214 610/8
Oklahoma Univ., Norman. School of Civil Engineering and Environmental Science.
EVALUATION OF WASTE WATERS FROM PETROLEUM AND COAL PROCESSING.
Environmental Protection Technology series,
George W. Reid, and Leale E. Streebin. Dec 72, 209p* EPA-R2-72-001
Paper copy also available from GPO $2.75 as EP1.23/2:72-001.

Descriptors: (*Petroleum industry, Water pollution), (*Coal preparation, Water pollution), (*Water pollution, *Industrial wastes), (*Refineries, *Industrial waste treatment), Drilling, Petroleum transportation, Oil storage, Coal mines, Coke, Brines, Injection wells, Tanker ships, Waste disposal, Cost estimates, Phenols, Flotation.
Identifiers: *Mine acid drainage, *Liquid waste disposal, *Oil pollution, *Oil wastes, *Water pollution control, Biological industrial waste treatment.

The report presents an evaluation on pollution problems, abatement procedures and control techniques relevant to the petroleum and coal industries. Petroleum wastes are discussed under three broad sections: Drilling-production, Transportation and storage, and Refining. Within each section, petroleum wastes are identified as to their source, volume, and composition, and waste treatment methods are discussed. The results of a field study of three small refineries are also reported. Coal mining, coal processing, and coal utilization, the wastes associated with each, and the corresponding control measures are presented. Acid mine drainage, the most significant pollution problem from coal mining, and possible control measures are discussed. The major pollution problems associated with coal processing originate from coal cleaning, the coking process, and refuse disposal. The production of coke by carbonization of coal and its pollutants are reviewed.

PB-214 614/0
National Water Well Association, Columbus, Ohio.
PROCEEDINGS OF THE NATIONAL GROUND WATER QUALITY SYMPOSIUM, AUGUST 25--27, 1971, DENVER, COLORADO.

Aug 71, 217p W73-04635, EPA-16060-GRB-08/71
Contract EPA-68-01-0004
Sponsored in part by Environmental Protection Agency, Washington, D.C.
Paper copy available from GPO $1.75 as EP1.16:16060 GRB 08/71.

Descriptors: (*Water pollution, *Ground water), (*Meetings, Ground water), Waste disposal, Industrial wastes, Injection wells, Water quality, Ground water recharge, Sewage, Pesticides, Oils, Earth fills, Inorganic nitrates, Aquifers.
Identifiers: *Liquid waste disposal, Sanitary landfills, Solid waste disposal, Acetic acid/nitrilo-tri.

Contents include: EPA's role in groundwater protection; The contributions of C. E. Jacob to scientific hydrology and engineering works; Subsurface disposal of liquid industrial wastes in Alabama - A current status report; Subsurface storage and

disposal in Illinois; Feasibility of recharging treated sewage effluent into a deep sandstone aquifer; Pesticide contamination of a shallow bored well in the southeastern coastal plains; Gasoline pollution of a ground-water reservoir - A case history; Petroleum contamination of ground water in Maryland; Ground-water pollution potential of a landfill above the water table; Groundwater pollution and sanitary landills - a critical review; Effect of early day mining operations on present day water quality. Methods of geologic evaluation of pollution potential at mountain homesites; Nitrate in ground water of the Fresno-Clovis Metropolitan area, California; The use, abuse and recovery of a glacial aquifer; A systems approach to management of the Hanford groundwater basin; Salty ground water and meteoric flushing of contaminated aquifers in West Virginia; and Probable impact of NTA on ground water.

PB-214 628/0
Notre Dame Univ., Ind. Dept. of Civil Engineering.
REMOVAL OF ORGANIC AND EUTROPHYING POLLUTANTS BY CHEMICAL - BIOLOGICAL TREATMENT.

Apr 72, 138p EPA-R2-72-076, W73-04636

Descriptors: (*Sewage treatment, *Chemical removal (Sewage treatment)), (*Phosphorus, Chemical removal (Sewage treatment)), (*Nitrogen, Chemical removal (Sewage treatment)), Activated sludge process, Pilot plants, Precipitation (Chemistry), Design criteria, Cost estimates, Nitrification, Engineering drawings, Aluminates, Alums.
Identifiers: Denitrification, Sodium aluminates.

The principal objective was to demonstrate, on a pilot plant scale (65,000 gallons per day), that a combined biological-chemical treatment scheme can effectively remove organic carbon, phosphorus and nitrogen from wastewater. The treatment scheme consisted of: Organic carbon removed by activated sludge type processes; Phosphorus removal by chemical precipitation with aluminum, and Nitrogen removal by biological-denitrification techniques. Process design loading factors were developed. The total cost of wastewater treatment was estimated.

PB-214 649/6
Georgia Inst. of Tech., Atlanta.
CHARACTERIZATION OF STREAM REAERATION CAPACITY,
Ecological research series,
E. C. Tsivoglou, and J. R. Wallace. Oct 72, 324p EPA-R3-72-012, W73-05213
Paper copy available from GOP $3.75 as EP1.23:72-012.

Descriptors: (*Stream pollution, *Aeration), (*Water pollution, Aeration), Effectiveness, Mathematical models, Stream flow, Diffusion, Tracer studies, Dissolved gases, Oxygen, Biochemical oxygen demand, Hydrography, Field tests, Turbulent flow, Mass transfer.
Identifiers: *Water pollution control.

Research was conducted to characterize stream reaeration capacity in terms of the stream hydraulic properties and to develop procedures for evaluating the effects of pollutants on reaeration. A gaseous tracer procedure was used in the field studies for measurement of reaeration. Not only have these studies incorporated a wide range of hydraulic features, but also, the range of BOD's and temperatures encountered was large. Tests of observed vs. predicted values of K (2) have shown that none of the available models is capable of providing dependable predictions of stream reaeration capacity, especially under highly turbulent flow conditions. A new model was derived that explains the reaeration capacity of a stream in terms of the rate of energy dissipation and furthermore, provides dependable predictions.

PB-214 687/6
National Environmental Research Center, Edison, N.J. Edison Water Quality Research Div.
THE SWIRL CONCENTRATOR AS A COMBINED SEWER OVERFLOW REGULATOR FACILITY,
Richard Field. Sep 72, 184p* EPA-R2-72-008, W73-05214
Paper copy available from GPO $2.25 as EP1.23/2:72-008.

Descriptors: (*Overflows, *Flow regulators), (*Combined sewers, Overflows), (*Separators, Combined sewers), Flow control, Swirls (Concentrators), Design, Mathematical models, Settling, Solids, Hydraulic models.
Identifiers: Sewage flow rate, *Water pollution control.

A combined sewer overflow regulator which by induced hydraulic conditions separates settleable and floatable solids from the overflow was studied. A mathematical model was also prepared to determine a basis for design. The study also used a hydraulic model to determine swirl concentrator configurations, flow patterns and settleable solid removal efficiency. Excellent correlation was found between the two studies. It was found that at flows which simulate American experience a vortex flow pattern was not effective. However, when flows were restricted, a swirl action occurred and settleable solids were concentrated in the outflow to the interceptor in a flow of two to three percent as compared to the quantity of overflow through a central weir and down shaft. The swirl concentrator appears to offer a combined sewer overflow regulator that effectively regulates the flow and improves the quality of the overflow, with few moving parts.

PB-214 688/4
Battelle Columbus Labs., Ohio.
POLYMER FILM OVERLAY SYSTEM FOR MERCURY CONTAMINATED SLUDGE - PHASE I,
Michael U. Widman, and Michael M. Epstein.
May 72, 84p W73-05218, EPA-16080-HTZ-05/72
Contract EPA-68-01-0088
Paper copy available from GPO $1.00 as EP1.16:16080HTZ05/72.

Descriptors: (*Water pollution, *Mercury (Metal)), (*Polymeric films, Sediments), (*Barrier coatings, *Sediments), Mercury halides, Chlorides, Mercury organic compounds, Nylon 6, Polyethylene, Cost estimates, Continuous casting, Extrusion.
Identifiers: *Water pollution control, Mercury/dimethyl.

Various polymer films to be used in sealing mercury contaminated sediments were studied. Materials were selected for detailed study on the basis of barrier properties to mercury compounds, strength, handleability, and estimated service life. Although most polymers are effective barriers to $HgCl_2$, the resistance to organic compounds can vary from poor to very good. Nylon 6 and high density polyethylene proved to be the most effective barriers to organic mercury. It was concluded that polymer films can be effectively used to seal mercury contaminated sediments. Estimated costs for film deployment are given and equipment concepts for film deployment were demonstrated. The nylon 6 system was recommended for field demonstration.

PB-214 695/9
Environmental Protection Agency, Chicago, Ill. Region V.
AIR MODULATED VACUUM OIL RECOVERY COLLECTION OF SPILLED OIL (FOAMS).
Environmental Protection Technology series,
Clifford Risley. Aug 72, 67p EPA-R2-72-033, W73-05217
Paper copy available from GPO $0.75 as EP1.23/2:72-033.

Descriptors: (*Oils, *Vacuum cleaners), (*Water pollution, Oils), Collecting methods, Foams, Separation, Vacuum apparatus, Tests, Foaming agents.
Identifiers: *Oil pollution removal, Oil spills.

An air modulated vacuum oil recovery technique was developed in an experimental and engineering design project as a method of collecting oil spilled on water. A foam is produced using foaming agents in order to facilitate the removal. The prototype device possessing a self contained power source proved capable of rapidly recovering thin slicks of oil (less than 4 mm) from water surfaces with only a small amount of water present (less than 10% by volume) in the recovered oil. The prototype recovered oil at the rate of 450 gal/hr for a thin oil slick. Thicker slicks could be recovered much more rapidly. The process and laboratory equipment is described.

PB-214 696/7
Lake Michigan Enforcement Conference. Lake Michigan Interstate Pesticides Committee.
AN EVALUATION OF DDT AND DIELDRIN IN LAKE MICHIGAN.
Ecological research series.

Aug 72, 140p W73-05380, EPA-R3-72-003
Paper copy available from GPO $1.25 as EP1.23:72-003.

Descriptors: (*Water pollution, *Pesticides), (*Lake Michigan, Water pollution), (*Chlorine organic compounds, Water pollution), (*Ecology, Pesticides), Fresh water fishes, Invertebrates, DDT, Dieldrin, Surface water runoff, Indicator species, Residues, Accumulation, Birds, Economic analysis, Trout, Salmon, Public health, Phthalates, Industrial wastes, Sewage, Legislation.
Identifiers: *Water pollution effects (Animals), *Water quality data, *Pesticide residues, *Biphenyl/chloro.

An investigational program was designed to provide information essential to evaluate the impact of pesticides on Lake Michigan. Data was collected from waters, wastewaters, invertebrate organisms, and fish; analysis of samples from open water for the purpose of developing general residue levels was impractical. Tributary streams to Lake Michigan discharge chlorinated hydrocarbon pesticides into the lake; urban and fruit-growing areas are the more significant contributors of pesticides. The polychlorinated biphenyls are present in sufficient quantity, with sufficient evidence of biological impact, to warrant independent evaluation. Resident fish appear to be the most reliable biological monitor. The biological magnification of chlorinated hydrocarbon insecticides in sport and commercially valuable fish species as well as other wild animals are discussed.

PB-214 697/5
West Virginia Univ., Morgantown. Coal Research Bureau.
UNDERGROUND COAL MINING METHODS TO ABATE WATER POLLUTION: A STATE OF THE ART LITERATURE REVIEW,
Larry W. Wilson, Noah J. Matthews, and James L. Stump. Dec 70, 51p W73-05215, EPA-14010-FKK-12/70
Paper copy available from GPO $0.60 as EP1.16:14010FKK12/70, stock no. 5501-0094.

Descriptors: (*Coal mines, Mine waters), (*Water pollution, Mine waters), Reviews, Subsurface drainage, Coal mining, Silica gel, Inert atmospheres, Grouting, Sealing, Hydrogeology.
Identifiers: *Water pollution control, *Mine acid drainage.

The report is a review of published information pertaining to the abatement of harmful drainage from underground coal mines. Reviewed are new physical approaches to the problem of interdicting

water entry into coal mines. These include land management for surface and sub-surface water diversion, the exploitation of water carrying strata, and new mining methods. Some chemical approaches to abatement reviewed include the use of silica gel solutions underground to prevent acid formation, the use of inert gas in active mines, and the use of new and the refinement of known grouting agents.

PB-214 747/8
Robert S. Kerr Water Research Center, Ada, Okla.
RESEARCH NEEDS FOR IRRIGATION RETURN FLOW QUALITY CONTROL,
Gaylord V. Skogerboe, and James P. Law, Jr. Nov 71, 102p
Prepared in cooperation with Colorado State Univ., Fort Collins.
Paper copy available from GPO $1.00, as stock no. EP1.16:13030;11/71.

Descriptors: (*Irrigation, Water pollution), (*Ground water recharge, Irrigation), (*Water pollution, *Ground water), Research, Water quality, Coachella Valley, California, Imperial Valley, Salton Sea, Mexicali Valley, San Joaquin Valley, Yakima Valley, Snake River basin, Colorado River basin, Salt water, Water consumption, Nutrients.
Identifiers: Return flow, Water pollution abatement.

There are a multitude of research needs regarding irrigation return flow quality, but only the specific research needs required to undertake an effective control program are described. These research needs include irrigation practices, soil-plant-salinity relationships, leaching requirements, prediction of subsurface return flow, cultural practices, irrigation scheduling, treatment of return flows, economic evaluations, and institutional control methods.

PB-214 750/2
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
PROCEEDINGS OF INTERNATIONAL CONFERENCE ON FLUIDIZED-BED COMBUSTION (2ND).

4 Oct 70, 317p AP-109

Descriptors: (*Fluidized bed processors, *Combustion), (*Meetings, Fluidized bed processors), (*Air pollution control equipment, Fluidized bed processors), (*Boilers, Fluidized bed processors), Coal, Pilot plants, Limestone, Desulfurization, Fuels, Design, Sulfur dioxide, Combustion efficiency, Process control, Electric power plants, Air pollution.
Identifiers: *Air pollution control, Limestone injection.

The document contains a collection of papers which were presented at the Proceedings of the Second Internation Conference on Fluidized-Bed Combustion. The Conference consisted of six sessions: Session I, consisting of six presentations, was titled, Small-Scale Development of Fluidized-Bed Combustion; Session II, also with six papers dealt with, Control of Combustion Pollutants; seven part Session III, covered Gasification to Desulfurize Coal Sessions IV and V were both titled, Conceptual Design and Economic Feasibility. The two sessions combined consisted of eleven presentations. (Author)

PB-214 759/3
Environmental Protection Agency, Washington, D.C. Office of Research and Monitoring.
PROJECTS OF THE MUNICIPAL TECHNOLOGY BRANCH THROUGH JUNE 1972,
William A. Rosenkranz. Sep 72, 543p* W73-05212, EPA-R2-72-080
Paper copy available from GPO $6.00 as EP1.23/2:72-080.

Descriptors: (*Sewage treatment, Contracts), (*Industrial waste treatment, Contracts), (*Water pollution, *Contracts), Projects, Sewers, Sewage, Urban areas, Cold weather operations, Sludge digestion, Grants, Storm sewers, Research, Surface water runoff.
Identifiers: *Water pollution control, *Water pollution abatement, Sewage treatment effluent.

The report is a compilation of information sheets on the 448 projects initiated since fiscal year 1967 through fiscal year 1972. The projects are primarily concerned with sewage and industrial treatment; however, some of the studies concern water pollution control through modifying the sources. The objectives, fiscal information and a brief description of the initiated project are contained on each sheet. Also presented is general information on the mission of the Municipal Technology Branch, its needs, problems, accomplishments, organization and resources history. A listing is included of the new Program Element Numbers with the corresponding previous operating unit mission designations. (Author)

PB-214 760/1
URS Research Co., San Mateo, Calif.
METHODS OF PREDICTING SOLID WASTE CHARACTERISTICS,
Gail B. Boyd, and Myron B. Hawkins. 1971, 33p EPA-SW-23c
Contract PH-86-68-98
Paper copy available from GPO $0.40 as stock no. 5502-0048.

Descriptors: (*Waste disposal, Predictions), Management planning, Refuse, Mathematical models, Regional planning, Waste paper, Glass, Metals, Inventories, Classifying.
Identifiers: *Solid waste disposal.

The design, implementation, and operation of efficient and economical solid waste collection, handling, transport, and disposal systems require accurate information on the quantities and characteristics of the solid waste to be processed. The study reported develops methods that can be applied to real (or hypothetical) cities, counties, and regions for estimating the quantity and character of the solid wastes generated at present and at various times in the future.

PB-214 764/3
Midwest Research Inst., Kansas City, Mo.
RAPID DETECTION SYSTEM FOR ORGANOPHOSPHATES AND CARBAMATE INSECTICIDES IN WATER,
Thomas B. Hoover. Aug 72, 70p* EPA-R2-72-010
Contract EPA-68-01-0038
Paper copy available from GPO $0.95 as EP1.23/2:72-010.

Descriptors: (*Insecticides, *Water analysis), (*Carbamates, Water analysis), (*Phosphorus organic acid esters, Water analysis), Warning systems, Monitors, Hazardous materials, Cholinesterase inhibitors, Design, Wiring diagrams, Performance evaluation, Enzymes.
Identifiers: *Electrochemical enzyme alarms, Enzyme technology, *Water pollution detection.

An apparatus for the detection and monitoring of water supplies for hazardous spills of organophosphate and carbamate insecticides has been designed and fabricated. The new unit is called the Cholinesterase Antagonist Monitor, CAM-1, because it produces an alarm in 3 min. when toxic or subtoxic levels of cholinesterase antagonists are present in water. Response of this apparatus to subtoxic levels of azodrin, sevin, dimetilan, malathion, parathion and DDVP has already been demonstrated. CAM-1 uses immobilized cholinesterase for the collection of cholinesterase inhibitors from the water supplies. The activity of the immobilized cholinesterase is determined automatically in an electrochemical cell by passing a substrate solution over the enzyme at regular time periods. A minicomputer is used to automate the detection process and to signal an alarm. (Author)

PB-214 771/8
Ohio State Univ. Research Foundation, Columbus.
PILOT SCALE STUDY OF ACID MINE DRAINAGE.

Mar 71, 85p W73-05216, EPA-WQO-14010-EXA-03/71
Contract DI-14-12-97
Paper copy available from GPO $1.00 as EP1.16:14010EXA03/71.

Descriptors: (*Coal mines, Mine waters), (*Water pollution, *Mine waters), (*Pyrite, *Oxidation), Sulfates, Field tests, Oxygen, Transport properties, Diffusion, Aquatic microbiology, Inorganic sulfides, pH, Hydrology, Sealing, Seasonal variations, Ohio.
Identifiers: *Mine acid drainage.

In order to study pyrite oxidation and resulting acid mine drainage, a research facility was developed using a small, long-abandoned drift mine and six 33 inch diameter auger holes drilled in order to have comparable, isolated, experimental 'mines' on a pilot scale basis. Experimental data and observations of the effect of oxygen concentration on acid production have shown the location of major reaction zones and indicated that bacterial catalysis of pyrite oxidation is not a significant factor in production of acid mine drainage. When the correspondence between holes has been established, one hole will be used as a reference mine so that fluctuations due to hydrologic variations can be separated from effects of experimentally imposed changes in the other holes.

PB-214 811
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
CONTROL OF ATMOSPHERIC EMISSIONS FROM PAINT AND VARNISH MANUFACTURING OPERATIONS.
Technical rept.,
Robert L. Stenburg. Jun 58, 33p SEC-TR-A58-4

Descriptors: (*Air pollution, *Hydrocarbons), (*Varnishes, Air pollution).
Identifiers: *Paint industry, *Air pollution control.

Because of the large volume and wide variety of oils and resins processed, and because of the type and amount of materials lost to the atmosphere during the high temperature cooking processes, the production of paint and varnish vehicles establishes itself as the principal source of atmospheric pollution in this industry. The report describes the sources, control, and types of air pollution.

PB-214 811/2
Southern Methodist Univ., Dallas, Tex.
AQUATIC AND WETLAND PLANTS OF SOUTHWESTERN UNITED STATES,
Donovan S. Correll, and Helen B. Correll. Jan 72, 1792p W73-04999, EPA-16030-DNL-01/72
Paper copy available from GPO $7.75 as stock no. 5501-0177, EP1.16:16030DNL01/72.

Descriptors: (*Aquatic plants, *Taxonomy), (*United States, Aquatic plants), Swamps, Phreatophytes, Ferns, Water pollution, Plant growth, Plant ecology, Plant anatomy.
Identifiers: *Southwestern United States, Wetlands.

The primary aim of this detailed work is to enable one to identify ferns and flowering plants that grow naturally in polluted and unpolluted aquatic and wetland habitats in southwestern United States. These habitats may be permanently or seasonally wet. The basic criterion for the inclusion of a species is its ability to withstand a per-

manent or seasonally long submersion of at least its root system. This will unavoidably include some ubiquitous species. In addition, plants classed as phreatophytes, or those plants whose deeply penetrating roots tap the groundwater, are included. The term 'aquatic' represents one extreme condition of habitat covered by this research project, and is used to designate those plants that can attain their life cycle only in water. The term 'wetland' incorporates all other conditions of habitat, including the other extreme. (Author)

PB-214 869
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION CONTROL RESEARCH AND TRAINING GRANTS. LIST OF 1965 AWARDS: RESEARCH GRANTS, RESEARCH FELLOWSHIPS, TRAINING GRANTS, DEMONSTRATION GRANTS.

1965, 63p PHS-Pub-1100

Descriptors: (*Water pollution, *Grants).

The Federal Water Pollution Control Act authorizes the award of grants-in-aid for research, training, and demonstration projects, and for research fellowships. The purposes of these grants are to encourage, cooperate with, and assist appropriate authorities, agencies, institutions, and individuals in the conduct of studies and training relating to the causes, control and prevention of water pollution. Support is available for projects and fellowships designed to improve the sanitary condition of water, to conserve water for public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes, agricultural, industrial and for other legitimate uses. Four types of grants are available. The report lists, by state, the recipients of these grants. (Author)

PB-214 870
California Inst. of Tech., Pasadena.
100 PROBLEMS IN ENVIRONMENTAL HEALTH,
W. L. Faith, Jack E. McKee, H. Heukelekian, Thomas F. Mancuso, and Emil M. Mrak. 1961, 198p
Grant PHS-RG-7263

Descriptors: (*Public health, *Pollution), Air pollution, Water pollution, Industrial medicine, Food industry, Water supply, Waste disposal.
Identifiers: Solid waste disposal.

Contents:
- Air pollution;
- Food science and technology;
- Occupational health;
- Water supply and water pollution;
- Solid waste disposal and miscellaneous.

PB-214 871
Robert S. Kerr Water Research Center, Ada, Okla.
PHOSPHATE REMOVAL BY ACTIVATED SLUDGE. AMENABILITY STUDIES AT BALTIMORE, MARYLAND,
M. R. Scalf, F. M. Pfeffer, L. D. Lively, J. L. Witherow, and C. P. Priesing. Jun 69, 57p

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Sewage treatment, Phosphorus), (*Activated sludge process, Phosphorus), Inorganic phosphates.

Phosphate removal by sorption on activated sludge was investigated in pilot and plant scale at the Baltimore, Maryland, Back River Sewage Works. These studies revealed that the activated sludge plant was obtaining high phosphorus removal under conditions similar to those found in the San Antonio Rilling Plant. Pilot investigations were made on the amenability of the waste and activated sludge to phosphate removal. The effects of suspended solids and dissolved oxygen concentrations in the mixed liquor, phosphate additions, oxygen demanding substrate additions, and the addition of aluminum, iron, and magnesium salts on phosphate removal were determined and found to agree with previous information. The waste and sludge were very amenable to phosphate removal. (Author)

PB-214 872
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RADIATION SAFETY MANUAL FOR SANITARY ENGINEERING CENTER ACTIVITIES.
Technical rept.,
George I. Coats. 1959, 65p SEC-TR-R59-4

Descriptors: (*Radioactive isotopes, *Safety).

Contents:
- Organization;
- Radionuclides;
- Harzards;
- Protective measures;
- Instrumentation;
- Decontamination procedures;
- Radiation producing machines;
- Appendices.

PB-214 873
Federal Water Pollution Control Administration, Washington, D. C.
THE IDENTIFICATION AND MEASUREMENT OF CHLORINATED HYDROCARBONE PESTICIDES IN SURFACE WATERS,
A. W. Breidenbach, J. J. Lichtenberg, C. F. Henke, D. J. Smith, and J. W. Eichelberger, Jr. 1967, 80p
Errata sheet inserted.

Descriptors: (*Gas chromatography, *Pesticides), (*Water analysis, Pesticides), (*Water pollution, Pesticides), Sampling, Activated carbon, Chlorine organic compounds.
Identifiers: *Water pollution detection.

Chromatography and chromatographic instrumentation have made possible the development and application of additional techniques. These newer techniques, applied to carbon adsorption extracts as well as discrete water samples, have been used to provide definitive identification and measurement of chlorinated hydrocarbon pesticides in surface waters.

PB-214 874
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
HEALTH AND SAFETY IN THE ATOMIC ERA,
Conrad P. Straub. 1958, 20p
Sponsored by the New Jersey Chamber of Commerce, Held at Newark, New Jersey, October 2, 1958, for Publication' in the Proceedings of the New Jersey Atomic Energy Symposium.

Descriptors: (*Radioactive contaminants, *Public health), Sources.

An effort has been made to show what is being done by the AEC, the PHS, and other Federal and local agencies to measure the amount of radioactivity contributed from a multiplicity of sources and relate their data to potential public health implications. There is a need for more data of this nature, particularly in terms of the specific radionuclides present in food materials grown all over the nation and the world. With such information on hand, we shall be able to define with a greater degree of accuracy the public health implications of such radiation levels and to provide a better basis for developing more realistic maximum permissible concentration levels in a greater variety of environmental media. (Author)

PB-214 875
Pacific Northwest Water Lab., Corvallis, Oreg.
AERATED LAGOON TREATMENT OF FOOD PROCESSING WASTES.
Water pollution control research series,
Kenneth A. Dostal. Mar 68, 55p EPA-12060-03/68
Paper copy available from GPO $1.25 as EP1.12060-03/68.

Descriptors: (*Food processing, *Industrial waste treatment), (*Lagoons (Ponds), Industrial waste treatment).
Identifiers: *Aeration ponds, *Water pollution control, *Pea processing.

The food-processing industry is the second largest industrial source of waterborne organic wastes in the Pacific Northwest. Adequate secondary treatment of these wastes by conventional processes is complicated by the seasonal nature of most of the food-processing plants and the large capital expenditures for waste treatment facilities which may be used for only a few months each year. The report presents the data collected and the conclusions drawn from a six week period of sampling of an aerated lagoon used to treat wastes from the frozen pea processing plant of Kelley-Farquhar located at Ferndale, Washington.

PB-214 876
Ohio State Univ. Research Foundation, Columbus.
SULFIDE TO SULFATE REACTION MECHANISM. A STUDY OF THE SULFIDE TO SULFATE REACTION MECHANISM AS IT RELATED TO THE FORMATION OF ACID MINE WATERS,
E. E. Smith, and K. S. Shumate. Feb 70, 129p
Prepared in cooperation with Federal Water Pollution Control Administration.
Paper copy available from GPO $1.50 as stock no. EP2.10:14010 FPS-02/70.

Descriptors: (*Sulfide minerals, Oxidation), (*Pyrite, *Oxidation), (*Water pollution, *Mine waters), (*Biodeterioration, Pyrite), Aquatic microbiology, Iron sulfides, Ferrobacillus.
Identifiers: *Mine acid drainage.

A detail study of the mechanisms and kinetics of the chemical reactions responsible for acid mine drainage is discussed. The mineralogical features of the solid phase reactant (pyrite) that determine its reactivity were described. The rate-limiting reactions and variables affecting the rate of these reactions were identified. It was found that two basic oxidation modes are important: oxygenation, in which oxygen is the immediate oxidizing agent; and ferric ion (or microbiologically catalyzed) oxidation, in which ferric ions are the oxidants. From a knowledge of the dissolved oxygen, ferric/ferrous ratio, and total iron ion content at the reaction site, the reaction regime can be determined. Kinetic equations were derived for both reaction modes. From these basic relationships the oxidation rate in real pyritic systems can be accurately predicated when conditions at the reaction site are known. (Author)

PB-214 877
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY STORAGE REQUIREMENTS, MOUNTAIN PARK RESERVOIR, OTTER AND ELK CREEKS, OKLAHOMA.

May 62, 19p
Prepared in cooperation with Bureau of Reclamation, Amarillo, Tex.

Descriptors: (*Mountain Park Reservoir, *Water pollution), (*Oklahoma, Water pollution).

The report discusses methods for maintaining water quality at Mountain Park Reservoir, Oklahoma. The report presents water storage requirements and the procedure for calculating water quality requirements of Otter and Elk Creeks also in Oklahoma.

PB-214 878
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WATER AND SEWER BOND SALES IN THE UNITED STATES.
1961, 14p PHS-Pub-965

Descriptors: (*Water services, *Financing), (*Sewage treatment, Financing), United States.
Identifiers: *Bonds (Financing).

Data are presented in three categories according to the use of the proceeds from the sale: (1) Water, when the bonds have been sold to finance water facilities; (2) Sewer, to finance sewage facilities; and (3) Combination, to finance jointly water and sewage facilities where the portions attributable to each type are not designated. (Author)

PB-214 879
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
VIRUSES IN WASTE, RENOVATED, AND OTHER WATERS.
Literature abstracts,
Gerald Berg, and F. Dianne White. 1970, 23p

Descriptors: (*Water pollution, *Viruses), (*Sewage treatment, Viruses), Bibliographies.

The report contains a comprehensive compilation of current abstracts of a literature survey relevant to viruses present in world water sources.

PB-214 880
Federal Water Pollution Control Administration, Cincinnati, Ohio.
SANTEE RECREATION PROJECT, SANTEE, CALIFORNIA.
Final rept.,
John C. Merrell, Jr., William F. Jopling, Roderick F. Bott, Albert Katko, and Herbert E. Pintler.
1967, 174p WP-20-7
See also PB-169 370.

Descriptors: (*Water reclamation, *Sewage treatment), (*Reservoirs, Lagoons (Ponds)), (*Recreational facilities, *Lagoons (Ponds)).
Identifiers: *Santee (California).

The report presents the results of a study of the Santee, California recreational lakes, which were deliberately planned to utilize the community's reclaimed sewage effluent. By the summer of 1965, a special basin adjacent to one of the lakes was supplied with reclaimed water and used for swimming. This was found possible after progressive use of the lakes for boating and then for fishing. No health hazards have been demonstrated by the viral or other findings.

PB-214 882
Public Health Service, Washington, D.C.
ENGINEERING DESIGN OF REFUSE INCINERATORS. A MANUAL PREPARED FOR THE NATIONAL PARK SERVICE.

Jun 58, 39p

Descriptors: (*Incinerators, Design), (*Waste disposal, Incinerators), Manuals, Refuse disposal.
Identifiers: *Solid waste disposal.

The sanitary disposal of refuse is important to the maintenance of a healthful environment for the millions of visitors to the national parks each year. Incineration is a method of refuse disposal which has application in many areas administered by the National Park Service. The manual is a guide for National Park Service personnel to assist them in preparing specifications for, and the engineering design of, refuse incinerators.

PB-214 883
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER QUALITY CONTROL STUDY, BRANTLEY RESERVOIR, PECOS RIVER BASIN, NEW MEXICO.

Oct 66, 44p

Descriptors: (*Brantley Reservoir, *Water resources), (*Pecos River Basin, *Water pollution), (*New Mexico, Water pollution).
Identifiers: *Water pollution control.

The investigation disclosed a need for storage for water quality control purposes in the proposed Brantley Reservoir. These conclusions are based on the results of economic, demographic and engineering studies. (Author)

PB-214 884
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
LANE COUNTY (OREGON) PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.

13 Jan 62, 16p Working Paper-23
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River Basin, *Economic development), (*Oregon, Economic development).
Identifiers: *Lane County (Oregon).

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the Willamette River Basin. The study period is the 50-year period 1960-2010, with an interim point at 1980.

PB-214 885
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
QUANTITATIVE STUDIES OF BACTERIAL POLLUTION AND NATURAL PURIFICATION IN THE OHIO AND ILLINOIS RIVERS,
J. K. Hoskins. 1925, 23p

Descriptors: (*Ohio River, *Water pollution), (*Illinois River, *Water pollution), (*Bacteria, Water pollution), Purification.
Identifiers: *Water quality data.

The Public Health Service has been engaged for some years in studies of various phenomena concerned with the pollution and natural purification of streams. One general purpose of these studies has been to evaluate the intensity of bacterial pollution to be expected from known populations discharging sewage into streams of known discharge and velocity of flow. With this end in view we have collected detailed bacteriological data from two streams of quite different types, the Ohio and Illinois Rivers. Published observations on the Ohio River covered a period ot three years, while those of the Illinois River were continued for a complete year, so that in each case information was obtained throughout an entire seasonal cycle. (Author)

PB-214 886
Robert S. Kerr Water Research Center, Ada, Okla.
JAMES RIVER-WILSON CREEK STUDY, SPRINGFIELD, MISSOURI. VOLUME I.

Jun 69, 83p

Descriptors: (*James River, *Water pollution), (*Missouri, Water pollution), Fresh water fishes, Industrial wastes, Sewage.
Identifiers: *Fishkill, *Springfield (Missouri), *Storm water runoff, *Water pollution effects (Animals).

The report investigates occasional fish kills, associated with storm runoff, in the James River and in Wilson Creek below Springfield; and odorous and unsightly conditions in Wilson Creek in the vicinity of Wilson's Creek Battlefield National Park.

PB-214 887
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ANNUAL REVIEW (1959) OF LITERATURE ON RADIOACTIVE WASTES,
Conrad P. Straub. 1960, 47p
Prepared in cooperation with The Research Committee of the Water Pollution Control Federation.

Descriptors: (*Radioactive waste processing, *Reviews), (*Radioactive wastes, *Waste disposal).

This review is organized under the subject headings: mining and milling operations; fuel preparation and fuel element manufacture; fuel reprocessing; waste handling, treatment, and disposal; costs; and legislation. (Author)

PB-214 888
National Air Pollution Control Administration, Washington, D. C.
REPORT FOR CONSULTATION ON THE WASHINGTON, D. C. NATIONAL CAPITAL INTERSTATE AIR QUALITY CONTROL REGION.
Jul 68, 81p APTD-1216

Descriptors: (*District of Columbia, *Air pollution), (*Maryland, Air pollution), (*Virginia, Air pollution).
Identifiers: *Washington Metropolitan Area.

The Secretary, Department of Health, Education, and Welfare, is directed by the Air Quality Act of 1967 to designate air quality control regions to provide a basis for the establishment and implemenatation of air quality standards. In addition to listing the major factors to be considered in the development of region boundaries, the Act stipulates that the designation of a region shall be preceded by a consultation with appropriate State and local authorities. The National Air Pollution Control Administration, DHEW, has conducted a study of the Washington urban area, the results of which are presented in the report. (Author)

PB-214 889
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
COOPERATIVE STATE-FEDERAL STUDY OF POLLUTION OF NAVIGABLE WATERS - PUGET SOUND, STRAIT OF JUAN DE FUCA AND THEIR TRIBUTARIES AND ESTUARIES, STATE OF WASHINGTON.
Progress rept. 1 Oct 65-30 Jun 66.

30 Jun 66, 29p

Descriptors: (*Water pollution, *Puget Sound), (*Juan de Fuca Strait, Water pollution), (*Washington (State), Water pollution).

Investigations and studies include the following: (1) Engineering surveys which include a series of in-plant surveys at each of the sulfite pulp and paper mills in question to determine the quantity and quality of the wastes being discharged. (2) Oceanographic studies to determine the dispersion, travel, and persistence of pollutants in relation to currents and water movement. (3) Biological and related chemical studies of the marine environment and its living marine resources. (4) Tabulation of all sources of waste waters discharged in the study area and collection of additional data where the types of waste and/or point of discharge might affect study results. (5) Economic and legal investigations related to the over-all pollution problem. (Author)

PB-214 890
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
DELAWARE RIVER BASIN: SCHUYLKILL RIVER. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION CONTROL.
Water pollution series.
Apr 54, 90p PHS-Pub-408, PHS-WPS-70
Prepared in cooperation with Pennsylvania Department of Health, and Interstate Commission on the Delaware River Basin.

Descriptors: (*Schuylkill River, *Water pollution), (*Delaware River Basin, Water pollution), (*Pennsylvania, Water pollution).

The report contains pollution data available as of April 1954, on water pollution control measures in the Schuylkill River Basin which discharges to Zone 3 of the Delaware River Basin.

PB-214 891
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
OHIO RIVER POLLUTION SURVEY: ORGANIZATION AND METHODS OF LABORATORY STUDIES.
Final rept.
1942, 141P
Supplement 'B' to Final Report to the Ohio River Committee, Ohio River Pollution Survey.

Descriptors: (*Ohio River Basin, *Water analysis), (*Water pollution, Water analysis).

The report describes sampling and analytic methods used to determine water quality of streams in the Ohio River Basin.

PB-214 892
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
OHIO RIVER POLLUTION SURVEY: ACID MINE DRAINAGE STUDIES.
Final rept.
1942, 71P
Supplement 'C' to Final Report to the Ohio River Committee, Ohio River Pollution Survey.

Descriptors: (*Water pollution, Mine waters), (*Ohio River Basin, *Mine waters).
Identifiers: *Mine acid drzinage.

The report contains an in-depth analysis of water pollution relative to acid mine drainage in the Ohio River Basin.

PB-214 893
Public Health Service, Cincinnati, Ohio.
OHIO RIVER POLLUTION SURVEY: BIOLOGICAL STUDIES.
Final rept.

1942, 131P
Supplement 'F' to Final Report to the Ohio River Committee, Ohio River Pollution Survey.

Descriptors: (*Ohio River Basin, *Biological surveys), (*Water pollution, Ohio River Basin).
Identifiers: *Water pollution effects (Plants), *Water pollution effects (Animals).

The primary purpose of the biological studies in connection with the Ohio River Pollution Survey was twofold; first, to determine present biological conditions as a record to be compared with conditions after future changes due particularly to remedial measures which may be instituted, and second, to determine the effect, particularly of a destructive nature, of present sources of pollution on stream biological communities and fish life as a guide in judging the need for corrective measures. Secondary purposes include determination of what biological and chemical conditions may be typical of different pollutional situations, what factors under man's control are involved in creating these situations, and what combinations of these conditions may be allowed for designated stream uses. (Author)

PB-214 894
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
OHIO RIVER POLLUTION SURVEY: INDUSTRIAL WASTE GUIDES.
Final rept.

1942, 14P
Supplement 'D' to Final Report to the Ohio River Committee, Ohio River Pollution Survey.

Descriptors: (*Ohio River Basin, *Industrial wastes).

The report establishes guidelines for documenting results obtained from investigations of industrial waste pollution in the Ohio River Basin.

PB-214 895
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
GROUND WATER CONTAMINATION. PROCEEDINGS OF THE 1961 SYMPOSIUM HELD IN CINCINNATI, OHIO, 5-7 APR 61.
Technical rept.
1961, 223P SEC-TR-W61-5

Descriptors: (*Water pollution, *Ground water), Meetings.

Contents:
- Hydrogeological aspects of ground water contamination;
- Types of contaminants;
- Specific incidents of contaminants in ground water;
- Regulations and their administration;
- Research on ground water contamination.

PB-214 896
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PREVENTION AND CONTROL OF AIR POLLUTION BY PROCESS CHANGES OR EQQUIPMENT,
Andrew H. Rose, Jr., David G. Stephen, and Robert L. Stenburg. 1957, 70p
Presented at the Expert Committee on Air Pollution, World Health Organization, Palais des Nations, in Geneva (Switzerland), 18 November, 1957.

Descriptors: (*Air pollution, *Particles), (*Air pollution control equipment, Particles), (*Separators, Air pollution control equipment), (*Air filters, Air pollution control equipment), (*Electrostatic precipitators, Air pollution control equipment), (*Scrubbers, Air pollution control equipment).
Identifiers: *Air pollution control.

The report discusses two particulate air pollution control techniques: Reduction of contaminant discharge at the source by application of control equipment; and Reduction at the source through raw material changes, operational changes or replacement of process equipment.

PB-214 897
Public Health Service, Washington, D.C.
PROCEEDINGS OF GOVERNORS' CONFERENCE ON HEALTH HAZARDS IN URANIUM MINES HELD IN DENVER, COLO., 16 DEC 60.
Summary rept.

1961, 16P PHS-Pub-843

Descriptors: (*Uranium ores, *Radiation hazards).
Identifiers: *Uranium mining, *Mine safety.

The report is based on the proceedings of a meeting of the Governors and their representatives of those States engaged in uranium mining. The States participating were Arizona, Colorado, Montana, New Mexico, South Dakota, Utah, and Wyoming. An outgrowth of inter-departmental studies of the occupational health problems of uranium miners made over a period of years by the Public Health Service, the Atomic Energy Commission, the Bureau of Mines, and the Department of Labor, the conference had a three-fold purpose: (1) to make known provocative data concerning the health of uranium miners; (2) to present information on experiences in controlling radiation hazards; and (3) to work out a cooperative program with the States for improving mining conditions and preventing the development and extension of serious health problems. (Author)

PB-214 898
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
OXYGEN RELATIONSHIPS IN STREAMS.
Technical rept.

Mar 58, 193p SEC-TR-W58-2
Proceedings of a Seminar Sponsored by the Water Supply and Water Pollution Program of the Sanitary Engineering Center, October 30-November 1, 1957.

Descriptors: (*Stream pollution, *Dissolved gases), (*Water pollution, *Water chemistry), (*Oxygen, *Rivers), (*Aeration, Rivers).

Contents:
- The use of stream data in administration of pollution abatement programs;
- Dissolved oxygen requirements for fishes;
- The oxygen sag and dissolved oxygen relationships in streams;
- The measurement and calculation of stream reaeration ratio;
- Significance of organic sludge deposits;
- Oxidation, reaeration, and mixing in the Thames estuary;
- Mixing and diffusion of wastes in streams;
- Effects of impoundments on oxygen resources;
- Representative sampling and analytical methods in stream studies;
- Application of stream data to waste treatment design;
- Algae and their effects on dissolved oxygen and biochemical oxygen demand;
- Areas for future study - a panel discussion.

PB-214 899
Public Health Service, Washington, D.C.
POTENTIAL MUNICIPAL AND INDUSTRIAL WATER QUALITY REQUIREMENTS, AND QUANTITY AND QUALITY OF RETURN FLOWS IN THE NECHES, TRINITY, COLORADO, SAN JACINTO, BRAZOS, SAN ANTONIO, GUADALUPE, AND NUECES RIVER BASIN AND ADJOINING AREAS.
May 60, 75p
Prepared in cooperation with U.S. Study Commission, Texas.

Descriptors: (*Texas, *Water pollution), (*Water quality, Requirements).
Identifiers: Return flow, *Water quality data.

The quality of water of the nine Texas river basins was measured and is presented in terms of the amount of specific impurities it may contain. Although there is a myriad of water-soluble materials, only those impurities that are specifically detrimental to a subject user will be discussed. Statements are also included on the quality requirements of municipal use, nine major categories of industrial use, irrigation, stock watering, and recreation.

PB-214 900
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.

A REPORT OF WATER POLLUTION IN THE UPPER MISSOURI DRAINAGE BASIN.

May 52, 52p PHS-Pub-131, PHS-WPA25
Prepared in cooperation with Montana State Board of Health.

Descriptors: (*Mississippi River basin, *Water pollution), (*Montana, Water pollution), Upper Missouri River basin.

This report is based on data available as of January 1, 1952, on sources of pollution, treatment facilities employed, and stream conditions. The report also presents information concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result form pollution prevention and abatement, pollution prevention measures in effect and those which are needed. (Author)

PB-214 901
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SEPTIC TANK RESEARCH DEVELOPMENTS,
James B. Coulter. 1951, 22p

Descriptors: (*Septic tanks, Performance evaluation).

The purpose of the study is an attempt to find out what happens in the residential sewage disposal system and its parts under various loading and environmental circumstances. With such information it should be possible to develop recommendations for design standards and servicing procedures which are fundamentally sound because they are based on facts. A staggering variety of experiments and investigations have been conducted by the Staff at Cincinnati. Efforts have been expended along three major lines of endeavor: Field Investigations, Soil Studies, and Studies of Septic Tanks and Related Appurtenances.

PB-214 902
Esso Research and Engineering Co., Linden, N.J. Process Research Div.
RENOVATION OF WASTE WATER BY FOAM AND EMULSION FRACTIONATION,
I. A. Eldib, and R. M. Skomoroski. 1963, 147p
PcRD.4M-63
Contract PH-86-62-26

Descriptors: (*Sewage treatment, *Flotation), Dissolved organic matter.
Identifiers: *Foam fractionation.

A study was made to evaluate the feasibility of using foam fractionation alone, or in combination with carbon adsorption, to remove detergents and other water soluble organic impurities from waste water. Emulsion fractionation was also evaluated briefly as a waste water purification technique. Future population growth in the U.S. is expected to require more fresh water than is presently available and the Esso Research and Engineering Co., has studied the feasibility of using foam fractionation, alone and in combination with adsorption, also emulsion fractionation as means for renovating waste water for possible reuse. (Author)

PB-214 903
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A PROCEDURE FOR THE DETERMINATION OF CITRIC ACID IN WATER AND SEWAGE,
G. E. Terhoeven, and L. R. Setter. Oct 49, 8p

Descriptors: (*Water analysis, *Citric acid), (*Colorimetric analysis, Citric acid).
Identifiers: *Water pollution detection.

The determination of 1 to 50 p.p.m. of citric acid in water and sewage is an adaptation of the micro method goven by Natelson. The procedure consists of the bromination and oxidation of citric acid in aqueous solution to pentabromacetone which is then extracted with petroleum ether. An alkaline aqueous extraction of the ether solvent transfers the pentabromacetone to the water phase. The extractant buffered at pH 9.2 with borax and containing the reducing agent thiourea converts the pentabromacetone to a yellow color complex which is compared visually with permanent color standards or spectrophotometrically at a wave length of 440 millimicrons. (Author)

PB-214 904
Public Health Service, Denver, Colo. Region VIII.
WATER QUALITY CONTROL STUDY AND PUBLIC HEALTH ASPECTS OF THE CACHE LA POUDRE PROJECT COLORADO.

Jun 65, 69p
Prepared in cooperation with Bureau of Reclamation, Denver, Colo.

Descriptors: (*Cache la Poudre River basin, *Water pollution), (*Colorado, Water pollution), Sources, Reservoirs.

A study was made which disclosed the need for water quality control in the study area. This need was based on the present development and the projected future population and industrial growth. The existing diversion practices and water supply make it impractical for the use of streamflow regulation as a means of water quality control in the study area at this time. Therefore, the report makes no recommendations for the inclusion of storage in Idylwilde Reservoir for the purpose of streamflow regulation for water quality control. Because of the complex nature of the water use practices and water quality problems which exist throughout much of the South Platte River Basin, a comprehensive study of the entire basin is needed to obtain optimum use of water within the basin. (Author)

PB-214 905
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REMOVAL OF RADIOLOGICAL, BIOLOGICAL, AND CHEMICAL CONTAMINANTS FROM WATER.
Final technical rept.,
Richard L. Woodward, and Gordon G. Robeck.
1959, 139p SEC-TR-W59-2

Descriptors: (*Water treatment, *Detoxification), Military chemical agents, Military biological agents, Military radiological agents, Chlorination, Ion exchanging.

Hazard evaluation studies have shown that shore based Naval water supplies can be contaminated by chemical, biological, and radiological warfare agents. The greatest hazards to be guarded against appear to be radioactive fallout in surface waters and covert introduction of pathogenic vegetative bacteria or botulinum toxin into a water distribution system. Laboratory and engineering studies were conducted to determine the design criteria and cost estimates of providing and operating devices to protect against these contaminants. (Author)

PB-214 906
Maryland Univ., College Park. Dept. of Chemical Engineering.
THE ROLE OF WAVES AND MONOMOLECULAR FILMS ON GAS ABSORPTION.
Master's thesis,
Daniel Philip Boyd. 1965, 90p
Grant PHS-WP-00323

Descriptors: (*Adsorption, *Gases).
Identifiers: *Gaseous diffusion, Hexadecanols.

An experimental program was undertaken to determine the effect of small surface waves on interfacial mass transfer in a carbon dioxide-water system. A surface active agent, n-hexadecanol, was used to determine the effect on mass transfer. (Author)

PB-214 907
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE PUBLIC HEALTH SERVICE RESEARCH PROGRAM IN AIR POLLUTION,
Arthur C. Stern. 1955, 11p
Presented at the Sanitary Engineering Division Session, Annual Convention of American Society of Civil Engineers, New York, N. Y., 24Oct 55.

Descriptors: (*Air pollution, *Project planning), (*Public health, Project planning).

In setting up its air pollution research program, the Public Health Service has taken the view that the principal research resource of the nation lies in its universities, research institutes, and in the research establishments of American industry. In order to make maximum utilization of this tremendous research potential, two mechanisms are being employed: research grants and research contracts. The efficiency of these research programs is discussed.

PB-214 908
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WOOD NAVAL STORES - AN INDUSTRIAL WASTE GUIDE TO THE WOOD NAVAL STORES INDUSTRY.
May 52, 35p

Descriptors: (*Rosin, *Industrial wastes), (*Wood products, Industrial wastes), (*Refining, Wood products).
Identifiers: *Water pollution control.

Contents: Manufacturing processes, raw materials and products, volumes and characteristics of primary process and secondary process wastes, pollutional effects, and remedial measures.

PB-214 909
Environmental Protection Agency, Chicago, Ill. Water Quality Office.
ALGAE-TEMPERATURE-NUTRIENT RELATIONSHIPS AND DISTRIBUTION IN LAKE ERIE - 1968,
Robert P. Hartley, and Chris P. Potos. Feb 71, 95p

Descriptors: (*Limnology, *Lake Erie), (*Algae, Limnology), (*Ecology, Lake Erie), Environments, Temperature, Nutrition, Growth, Population (Statistics), Ohio, Seasonal variations, Nutrients, Primary biological productivity.

The report describes the time and space distribution of measured chemical, physical, and biological factors for a one-year cycle in the western and central basins of Lake Erie. The nearshore descriptions are based upon data gathered in a biweekly sampling program at 17 Ohio domestic water supply intakes from March 1968 through March 1969. The midlake descriptions are based upon data gathered at 20 midlake stations sampled four times between May 1967 and January 1968. Although the sampling times for nearshore and midlake were one year apart, for the purposes of this report the data are assumed to be comparable.

PB-214 911/0
PEDCo-ENVIRONMENTAL, Cincinnati, Ohio.
STATEWIDE INVENTORY OF AIR POLLUTANT EMISSIONS, STATE OF KANSAS 1970 (REVISED).
Timothy W. Devitt. 31 Dec 71, 87p PEDCO-72-2
APTD-1131
Contract EPA-68-02-0044
Supersedes PB-203 350.

Descriptors: (*Air pollution, *Kansas), Inventories, Sources, Tables (Data), Particles, Sulfur dioxide, Nitrogen oxides, Carbon monoxide, Hydrocarbons, Combustion products, Exhaust gases, Fuels, Coal, Natural gas, Industrial wastes, Electric power generation, Transportation.
Identifiers: *Implementation Air Pollution Planning Program, Air Quality Control Regions, Automobile exhaust, Air quality data.

The results of the emissions inventory for the State of Kansas are presented. The purposes of the study were: (1) to calculate the emissions of air pollutants from point and area sources in the State of Kansas; (2) to assemble the emission data in a suitable format for use in developing the Implementation Plan. The emissions inventory included the following pollutants: particulates, sulfur oxides, nitrogen oxides, carbon monoxide, and hydrocarbons. (Author)

PB-214 918
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RESEARCH IN WATER SUPPLY AND WATER POLLUTION AT THE ROBERT A. TAFT SANITARY ENGINEERING CENTER.
Technical rept.

1 Aug 59, 29p SEC-TR-W59-3

Descriptors: (*Water pollution, Research), (*Sewage treatment, Research), (*Indicator species, Water pollution), Water reclamation.

Contents:
- Characterization of wastes;
- Treatment of wastes for disposal;
- Disposal of waste effluents;
- Monitoring of wastes in streams;
- Treatment of water for reuse (reclamation of water);
- Supplement and conservation of water.

PB-214 919
Federal Water Pollution Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
PROCEEDINGS OF THE EUTROPHICATION-BIOSTIMULATION ASSESSMENT WORKSHOP HELD AT HOTEL CLAREMONT, BERKELEY, CALIFORNIA, ON JUNE 19-21, 1969,
E. J. Middlebrooks, T. E. Maloney, C. F. Powers, and L. M. Kaack. 1969, 289p
Prepared in cooperation with California Univ., Berkeley.

Descriptors: (*Limnology, *Water pollution), (*Bioassay, Water pollution), (*Algae, Water pollution).
Identifiers: *Eutrophication.

The workshop included the following sessions. Assay procedures session; Algal physiology session; Limnological investigations session; and Eutrophication control and applications session.

PB-214 920
Johns Hopkins Univ., Baltimore, Md. Dept. of Sanitary Engineering and Water Resources.
PROCEEDINGS OF THE CONFERENCE ON PHYSIOLOGICAL ASPECTS OF WATER QUALITY HELD IN WASHINGTON, D. C., 8-9 SEP 60,
Harry A. Faber, and Lena J. Bryson. 1960, 240p
Grant PHS-RG-7748

Descriptors: (*Trace elements, Water pollution), (*Water pollution, *Public health), (*Toxicology, Water pollution), (*Pesticides, Water pollution), Carcinogens, Metals.
Identifiers: *Water pollution effects (Animals).

Contents:
- Human health and well-being and the aqueous environment;
- The need for water quality criteria;
- Detection and analysis of chemicals in water;
- Occurrence of trace elements in water;
- Effects of trace amounts of molybdenum;
- Effects of trace amounts of selenium;
- Effects of trace amounts of vanadium;
- Effects of trace amounts of zinc;
- Physiological effects of insecticides;
- Physiological effects of organic phosphate pesticides;
- Chronic toxicity of dodecylbenzene sodium sulfonate;
- Cancer hazards from natural and artificial water pollutants;
- Minerals and trace elements;
- Insecticides;
- Organics.

PB-214 921
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SURVEY OF INTERSTATE POLLUTION OF THE ANIMAS RIVER (COLORADO-NEW MEXICO),
E. C. Tsivoglou, S. D. Shearer, R. M. Shaw, Jr., J. D. Jones, and J. N. Anderson. May 59, 138p

Descriptors: (*Animas River, *Water pollution), (*Colorado, Water pollution), (*New Mexico, Water pollution), Radioactive contaminants, Bacteria, Industrial wastes.
Identifiers: *Water quality data.

Studies of pollution problems of the interstate waters of the Animas River were performed to measure the extent of radioactive, chemical, organic, and bacteriological pollution, and the effects of pollution on existing legitimate uses of the interstate waters.

PB-214 922
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BIO-ASSAY INVESTIGATIONS FOR INTERNATIONAL JOINT COMMISSION. NIAGARA FALLS SEWAGE DISPOSAL PLANT, NIAGARA FALLS, NEW YORK,
Croswell Henderson. 1956, 14p

Descriptors: (*Niagara River, *Bioassay), (*Water pollution, Niagara River), (*New York, Water pollution), (*Toxicology, Water pollution), Fresh water fishes, Indicator species.
Identifiers: *Sewage treatment effluent, *Water pollution effects (Animals).

The report covers an investigation of the toxicity to fish of the influent and effluent from the Niagara Falls Sewage Disposal Plant. Chemical wastes from several industries enter this plant along with domestic sewage from the city of Niagara Falls, New York. Chemical wastes may contain compounds which are highly toxic to aquatic life. These compounds, when mixed with or under the influence of other non-toxic components of the effluent or receiving waters, may exert an entirely different toxicity from that of the pure compounds. Bio-assays were made to evaluate directly the toxicity of these chemically complex wastes which enter the Niagara River.

PB-214 923
Robert S. Kerr Water Research Center, Ada, Okla.
A NEW MULTIPLE SIEVE DESIGN FOR SCREENING BOTTOM SAMPLES,
David N. Peters, and Tommy N. Redman. Jul 69, 7p

Descriptors: (*Aquatic animals, Sieves), (*Sieves, *Samplers), Invertebrates, Size screening.

Sampling devices used by aquatic biologists to collect macroinvertebrates in a lake or stream vary with the kind of substrate to be sampled. Even when properly used, these sampling devices collect large amounts of debris which may prevent the biologist from efficiently concentrating or separating macroinvertebrates in the sample. A combined washing-screening process, conducted immediately following collection, is the best procedure for concentrating and separating organisms from the sample. This procedure is usually accomplished with a No. 30 U. S. Standard Sieve (openings of approximately 0.6 millimeter) that retains macroinvertebrates. The design and utilization of this device is described.

PB-214 924
Bureau of Solid Waste Management, Rockville, Md.
A REVIEW OF INDUSTRIAL SOLID WASTES,
Rodney L. Cummins. 1970, 46p

Descriptors: (*Waste disposal, *Industrial wastes).
Identifiers: *Solid waste disposal.

The Bureau of Solid Waste Management (BSWM) is currently undertaking long-range studies to more precisely define problems and establish guidelines for acceptable industrial solid waste management. Results of several studies conducted through BSWM demonstration grants and surveys are presented. The surveys are presented in a case history style, to give more complete understanding of the problems involved in industrial solid waste management.

PB-214 925
Illinois Univ., Urbana. Dept. of Civil Engineering.
NUTRIENT REQUIREMENTS AND BIOLOGICAL SOLIDS ACCUMULATION IN ANAEROBIC DIGESTION,
Richard E. Speece, and Perry L. McCarty. 1962, 28p
Presented at the International Conference on Sept 1962.

Descriptors: (*Sewage treatment, *Anaerobic processes), Digestion (Decomposition).
Identifiers: *Nutrient requirements.

Anaerobic digestion as known by the sanitary engineer is a unique and hardy process and has proved to be a powerful tool in the stabilization of strong organic wastes. Practically any type of organic matter can be decomposed to methane and carbon dioxide as the principal end products with very little in the way of toxic by-products being produced. The conversion of simple organic compounds to methane and carbon dioxide by the methane bacteria is a vital key to the successful operation of the process. Unsatisfactory digestion has usually been attributed to failure of the methane bacteria to process the simple organic compounds. The anaerobic process is studied and determine the growth requirements and synthesis relationships is studied in order to more fully utilize the excellent potentialities of anaerobic digestion as an organic waste treatment method and also to place process design on a stronger scientific basis.

PB-214 926
Federal Water Pollution Control Administration, Cincinnati, Ohio. Ohio Basin Region.
METHODS FOR MEASURING THE COLIFORM CONTENT OF WATER.
Final rept.,
Joseph A. McCarthy, and John E. Delaney. 26 Nov 65, 49p
Grant FWPCA-WP-00202

Descriptors: (*Water analysis, *Coliform bacteria).
Identifiers: *Water pollution detection.

The procedure developed for E. coli type I in Shellfish, Benthal deposits and turbid waters possesses the qualities of rapidity, satisfactory inclusiveness and high selectivity, which are desirable in a standard bacteriological procedure. The method is based on E. coli type I's ability to

produce indole while exposed to an incubation temperature of 44.5C and the inability of other bacterial species common to water, sewage and shellfish to perform this biochemical reaction.

PB-214 927
Environmental Health Center, Cincinnati, Ohio.
A STUDY OF TASTE AND ODOR PRODUCING CHEMICALS IN WASTES AND WATER SUPPLIES IN THE SOUTH LAKE MICHIGAN AREA,
F. M. Middleton, Harry Braus, and C. C. Ruchhoft. Sep 51, 42p

Descriptors: (*Water pollution, *Lake Michigan), (*Taste, Water pollution), (*Odors, Water pollution), (*Indiana, Water pollution), (*Illinois, Water pollution), (*Water supply, Taste), Refineries.

A study involving the application of the active carbon absorption and elution technique for concentration of organic compounds in water was made in the South Chicago area of Lake Michigan. This study demonstrated the importance of this technique for the concentration of organic materials and the useful application of organic group separation, elemental analysis and infrared spectroscopy to the adsorbates in studying a water pollution problem. The use of sulphur as a naturally occurring tracer element for selected wastes is indicated.

PB-214 928
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A PILOT STUDY OF AIR POLLUTION IN PROVIDENCE, RHODE ISLAND.
Technical rept.,
Marvin D. High, Robert W. Slater, and Genaro G. Costantino. Jun 62 46p SEC-TR-A62-15
Prepared in cooperation with City of Providence and Public Health Service.

Descriptors: (*Air pollution, *Rhode Island).
Identifiers: *Providence (Rhode Island), *Air quality data.

The continued effort of Providence, Rhode Island to maintain desirable air quality through an effective air pollution control program resulted in a study of existing and potential levels of pollution. The study was in two equal periods, July 31 through August 18 and October 31 through November 17, 1961. Air samples collected at a centrally located downtown station were analyzed for settling, suspended particulates, dustfall, sulfur dioxide, oxides of nitrogen, total oxidants, and carbon monoxide. Meteorological data for the sampling periods were analyzed and then compared with long-term data for the respective sampling periods.

PB-214 929
Rhode Island Univ., Kingston.
THERMOKINETICS IN ANAEROBIC DIGESTION.
Final progress rept., 1 Jan 61-31 Dec 64,
Frank J. DeLuise. 31 Dec 64, 5p
Grant FWPCA-WP-00200-03

Descriptors: (*Sewage treatment, Anaerobic processes), (*Anaerobic processes, Reaction kinetics), Digestion (Decomposition).

The aims of the study were to determine the effects of varying temperature, loading, and substrate composition on anaerobic digestion when the process is closely controlled. Also desired was a determination of whether the organisms producing the reactions in the process fall into obligate temperature categories or are facultative with respect to temperature, and a determination of the reaction rates in the decomposition of fats, carbohydrates and proteins during the process.

PB-214 930
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
USE OF STABILIZATION PONDS IN TREATING SEWAGE AND INDUSTRIAL WASTES,
W. W. Towne, and H. R. Pahren. 1959, 21p
Proceedings of the Southern Municipal and Industrial Waste Conference (8th), Chapel Hill, N. C. 2, 3 Apr 59.

Descriptors: (*Sewage treatment, *Lagoons (Ponds)), (*Industrial waste treatment, *Lagoons (Ponds)).
Identifiers: *Aeration ponds.

The document reviews various design criteria, their effectiveness and details of operation of stabilization ponds as a method for the treatment of raw sewage.

PB-214 931
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BIG SANDY RIVER BASIN. REPORT ON LOW FLOW REGULATION AND NAVIGATION POOL EVALUATION - POLLUTION ABATEMENT AND WATER SUPPLY.

Jan 57, 14p

Descriptors: (*Big Sandy River Basin, *Water pollution), (*Reservoirs, *Water quality).

The report has been prepared covering requested information as to the value of certain increases in low flow in the Big Sandy River Basin from the standpoint of pollution abatement and water supply, and the value or damage to water supplies by development of a series of navigation pools.

PB-214 932
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
POLLUTION SURVEY OF MINTERS CREEK AND THE BLACK WARRIOR RIVER IN THE VICINITY OF EUTAW, ALABAMA.
Sep 57, 45p

Descriptors: (*Black Warrior River, Water pollution), (*Minters Creek, Water pollution), (*Alabama, Water pollution), Water quality, Sewage.
Identifiers: *Eutaw (Alabama), *Sewage treatment effluent.

The report presents a survey of conditions in the vicinity of the town of Eutaw, Alabama, as related to the existing sanitary sewer outfall and the receiving streams, Minters Creek and the Black Warrior River.

PB-214 933
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BIO-ASSAY INVESTIGATIONS,
Croswell Henderson, and H. A. Anderson. 1956, 59p
Prepared in cooperation with Donner-Hanna Coke Corp., Buffalo, N. Y.

Descriptors: (*Buffalo River, *Bioassay), (*Water pollution, Buffalo River), (*New York, Water pollution), (*Toxicology, Water pollution), Fresh water fishes, Industrial wastes.
Identifiers: *Water pollution effects (Animals).

In January 1956, field studies were initiated on a cooperative basis to determine the possible effects of industrial wastes from major Buffalo River industries on the eastern end of Lake Erie and the Niagara River. Buffalo River industries on the eastern end of Lake Erie and the Niagara River. Buffalo River industries cooperating in this project were National Aniline Division-Allied Chemical and Dye Corporation, Donner-Hanna Coke Corporation, and Socony-Mobile Company. Part I of this report covers an investigation of the toxicity to fish of intake water and final effluent from the Donner-Hanna Coke Corporation. By-product coke wastes contain some chemical compounds which are known to be toxic to aquatic life in relatively low concentration. Part II of this report covers an investigation of the toxicity to fish of the various process wastes.

PB-214 934
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PROBATIVE VALUE OF A SINGLE AIR SAMPLING STATION IN A SOURCE-RECEPTOR PROBLEM.
Rept. for 16 Jan-15 Mar 56,
James E. Meeker. 1956, 17p
Presented at the Annual Meeting of the East Central Section of the Air Pollution Control Association, Columbus, Ohio, 17-18 Sep 56.

Descriptors: (*Air pollution, *Ohio), Industrial wastes.
Identifiers: *Saint Bernard (Ohio), *Air pollution sampling.

A two-month (Jan. 16 - March 15, 1956) study was undertaken to learn the probative value of a single field sampling station in determining whether air pollution experienced by a residential area in one city, St. Bernard, Ohio, was primarily attributable to a suspected group of industrial sources in that city, or to sources within the adjacent village of Elmwood Place and the surrounding city of Cincinnati. Results from the sampling station indicated that the combination of an excess of sulphates, nitrates and aliphatic hydrocarbons in St. Bernard air over concentrations elsewhere in Greater Cincinnati, an excess of SO2 and dirt shade associated with northerly winds, and visual observation of the travel of plumes from suspected sources confirm the suspicion that the alleged group of industrial sources are the cause of complaints of odorous air pollution in certain residential areas of St. Bernard. This study shows that it is possible to draw this limited type of conclusion from a short term study using a single air sampling station.

PB-214 935
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
DESCHUTES RIVER BASIN (OREGON). PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.

28 Feb 62, 13p Working Paper-15
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Deschutes River Basin, *Economic development), (*Oregon, Economic development), River basin development.

This analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the Deschutes River Basin which includes all of Jefferson, Crook and Deschutes Counties, all of Wasco County except for the northwest portion containing the Dalles, the western portion of Sherman County, and a small area in the north of Klamath County in Oregon.

PB-214 936
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PROBLEMS OF B.O.D. DETERMINATION AND INTERPRETATION,
C. C. Ruchhoft, M. B. Ettinger, and W. Allan Moore. 1971, 10p
Presented at the Missouri Water and Sewerage Conference, St. Joseph, Mo., 2 Oct 51.

Descriptors: (*Water analysis, *Biochemical oxygen demand), Tests, Standards.

Standard Methods states, 'The biochemical oxygen demand (frequently referred to as B.O.D.) of sewage, sewage effluents, polluted waters, or industrial wastes is the oxygen (in parts per million) required during stabilization of the decomposable organic matter by aerobic bacterial action.' Most frequently, the 5 day, 20 degree B.O.D. is determined by the dilution method. This is the determination discussed in the report, and it is referred to as the B.O.D. test. (Author)

PB-214 937
Southeastern Radiological Health Lab., Montgomery, Ala.
OFF-SITE MEDICAL PLANNING AND MANAGEMENT FOR AN EXPERIMENTAL UNDERGROUND NUCLEAR DETONATION,
Jamie K. Wheeler, Raymond T. Moore, and Melvin W. Carter. 8 Sep 70, 9p
Report on Project Sterling. Sponsored in part by the Advanced Research Projects Agency and the Atomic Energy Commission, Washington, D.C. Revision of report dated 8 Jul 70. Pub. in Health Physics, v21 p571-579 Oct 71.

Descriptors: (*Nuclear explosions, Safety), (*Public health, Nuclear explosions), Underground explosions, Radiological defense.
Identifiers: Sterling Operation.

The Bureau of Radiological Health, U.S. Public Health Service, provides comprehensive off-site radiological safety and medical programs for underground nuclear tests at the Nevada Test Site and for nuclear tests and experiments conducted at other geographical sites for non-weapons research and peaceful purposes. The specific physical requirements for these latter categories of use may preclude their being conducted at the Nevada Test Site. Future underground nuclear detonations for research and peaceful purposes may be held in locations which are not necessarily remote from relatively sizeable civilian populations. It is thus desirable to delineate the particular problems and their management involved in the public health medical planning for population safety, including such aspects as evacuation. These medical planning and management activities and their implementation for Project Sterling, a 350-ton yield underground nuclear detonation, which was conducted for seismic research purposes on 3 December 1966, in the Tatum Salt Dome near Hattiesburg, Mississippi, are described. (Author)

PB-214 940
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RADIATION SURVEILLANCE OF THE ENVIRONMENT.
Technical rept.,
Conrad P. Straub. 1959, 19p SEC-TR-R59-5

Descriptors: (*Radioactive contaminants, *Environmental surveys), (*Public health, Radioactive contaminants), Monitors.

The purpose of this paper is to indicate the variety of tests required for a detailed appraisal of the public health implications of the planned or accidental release of radioactive materials to the environment. (Author)

PB-214 941
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
COLLECTION OF DATA ON SOURCES OF POLLUTION.
Final rept.
1942, 88P
Supplement 'A' to Final Report to the Ohio River Committee, Ohio River Pollution Survey.

Descriptors: (*Water pollution, *Sampling), (*Ohio River, Water pollution), Sources.

Methods for investigating and recording water pollution sources as found on the Ohio River are described.

PB-214 942
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
PACIFIC NORTHWEST DRAINAGE BASINS: A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
1951, 94P PHS-Pub-87, PHS-WPS-6
Prepared in cooperation with Idaho State Department of Public Health, Montana State Board of Health, Oregon State Sanitary Authority, Washington State Pollution Control Commission, and Wyoming State Department of Public Health.

Descriptors: (*Pacific Northwest, *Water pollution), (*Water resources, Pacific Northwest).

The report is on the Pacific Northwest Drainage Basins. It presents information about the ways our water resources are used, the pollution going into out water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required. In part one, the water pollution problems of the basins as a whole is considered. Part two presents briefly the data for each of the several subbasins of the major basins, including a list of projects now known to be needed for water pollution control.

PB-214 943
West Virginia Univ., Morgantown. Coal Research Bureau.
UNDERGROUND COAL MINING METHODS TO ABATE WATER POLLUTION: A STATE OF THE ART LITERATURE REVIEW.
Water pollution control research series,
Larry W. Wilson, Noah J. Matthews, and James L. Stump. Dec 70, 50p EPA-14010-FKK-12/70
Paper copy available from GPO $0.60 as stock no. 5501-0094.

Descriptors: (*Water pollution, *Mine waters), (*Coal mines, Water pollution), Reviews.
Identifiers: *Mine acid drainage.

The report reviews published information concerning the abatement of harmful drainage from underground coal mines. Although much has been written on mine water management, very little literature is available on the specific area of preventing the formation of acid water. The references used in this report include mining engineering and hydrology studies and spans the period of time when water quantity rather than quality was the major consideration. Physical approaches to the problem of interdicting water entry into coal mines, beyond removal and treatment, are (a) land management for surface and sub-surface water diversion, (b) the exploitation of water carrying strata, and (c) new mining methods. Chemical approaches to abatement include (a) the use of silica gel solutions underground to prevent acid formation, (b) the use of inert gas in active mines and (c) the use of new and the refinement of known grouting agents. (Author)

PB-214 944
Robert S. Kerr Water Research Center, Ada, Okla.
PHOSPHATE REMOVAL BY ACTIVATED SLUDGE. AMENABILITY STUDIES AT SMITHFIELD, NORTH CAROLINE,
L. H. Myers, B. L. DePrater, L. D. Lively, J. L. Witherow, and C. P. Priesing. Nov 68, 30p

Descriptors: (*Activated sludge process, Phosphorus), (*Sewage treatment, Phosphorus), (*Chemical removal (Sewage treatment), *Phosphorus), Inorganic phosphates.

ORTHOPHOSPHATE REMOVAL BY ACTIVATED SLUDGE WAS INVESTIGATED IN PILOT AND PLANT SCALE AT THE Smithfield, North Carolina waste treatment plant. The report shows that the plant's secondary treatment process was not removing orthophosphate. Pilot studies in which sludge was acclimated in aerated jugs over a period of time showed removals reaching 65 to 90 percent. (Author)

PB-214 945
Public Health Service, Washington, D.C.
PUBLIC SEWAGE TREATMENT PLANT CONSTRUCTION - 1952.
1953, 20p PHS-Pub-291

Descriptors: (*Sewage treatment, *United States), Growth.

The report deals with the progress that the cities and towns of the Nation made during the year 1952 in constructing sewage treatment plants, the means by which pollution from cities is kept under control. (Author)

PB-214 947
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NATIONAL AIR SAMPLING NETWORK PROGRAM MANUAL FOR THE IBM 650 COMPUTER,
Arthur C. Stern, and Charles E. Zimmer. 1958, 121p

Descriptors: (*Air pollution, *Data processing), Computer programs, Manuals.
Identifiers: *Air pollution sampling, IBM 650 computer, *National Air Surveilance Networks.

The purpose of the program was to analyze data from chemical, physical, or meteorological measurements taken at random time intervals over a period of years at a number of measuring stations. Three forms of tabulation of each measured or computed item of data are prepared.

PB-214 948
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
DETERMINATION OF DEOXYGENATION COEFFICIENTS, WILLAMETTE RIVER, SUMMER 1961.

1961, 26p Working Paper-17
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River, *Deoxygenation), (*Biochemical oxygen demand, Willamette River).
Identifiers: *Water quality data.

In determining the waste assimilative capacity of streams within the Willamette Basin, Oregon, one of the primary considerations was determination of the deoxygenation coefficients (ksub1) for critical locations within the basin. During the summer of 1961 river samples were collected and analyzed for the determination of ksub1. Nine sampling stations were selected within the basin, seven on the main stem Willamette and two on tributary streams. These stations were located from river mile 7, near the mouth, to river mile 178 at Eugene.

PB-214 949
Public Health Service, Kansas City, Mo. Region VI.
WATER SUPPLY AND WATER QAULITY CONTROL STUDY BIG BLUE RIVER BASIN NEBRASKA AND KANSAS.

May 65, 58p
Report on Study of the Needs and Value of Storage for Municipal and Industrial Water Supply and Water Quality Control.

Descriptors: (*Blue River basin, *Water pollution), (*Reservoirs, Blue River basin), (*Nebraska, Water pollution), (*Kansas, Water pollution).

A study was made which discloses no present or future need (to the year 2070) for storage in reservoirs for municipal and industrial water supplies. Storage is needed, however, for present and future needs for water quality control. These conclusions are based on analysis of existing water quality information and hydrologic, economic and demographic analyses. Future needs are based on projected population and industrial growth. (Author)

PB-214 950
Radiation Application, Inc., Long Island City, N.Y.
CONTAMINANT REMOVAL FROM SEWAGE PLANT EFFLUENTS BY FOAMING.
Final contract rept. Jun 63-May 64,
Jacques J. Weinstock. Oct 64, 49p RAI-343
Contract SAph-76555

Descriptors: (*Sewage treatment, *Foaming), (*Flotation, Sewage treatment), Polyelectrolytes.

The report presents the results obtained from an evaluation of foaming techniques used to remove contaminants from sewage plant effluents.

PB-214 951
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A CRITICAL REVIEW OF THE LITERATURE OF 1958 ON WATER POLLUTION,
H. F. Clark, M. B. Ettinger, C. Henderson, W. M. Ingram, and P. W. Kabler. Mar 59, 93p
Prepared in cooperation with Federation of Sewage and Industrial Wastes Associations.

Descriptors: (*Water pollution, *Reviews).
Identifiers: *Water pollution effects (Plants).

Contents:
Biology;;
Microbiology;
Slime growths;
Chemistry;
Oxygen sag and stream self-purification;
Stream studies and surveys;
Stream standards;
Effects on water supplies;
Abatement and control.

PB-214 952
Alabama Univ., University.
NEMATODES IN SEWAGE AND SEWAGE TREATMENT FACILITIES.
Final progress rept.,
James V. Walters. Jan 68, 9p
Grant FWPCA-WP-00055

Descriptors: (*Disease vectors, *Nematoda), (*Worms, Disease vectors), (*Water pollution, Nematoda), (*Sewage treatment, Nematoda).

The objective of the research is the evaluation of the possibility of nematodes functioning as vectors of water-borne diseases. The system of events by which such disease transmission occurs is described.

PB-214 953
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SAMPLE COLLECTION TECHNIQUES FOR COMBUSTION SOURCES--BENZOPYRENE DETERMINATION,
Robert L. Stenburg, Darryl J. von Lehmden, and Robert P. Hangdbrauck. 1961, 15p
Presented at the American Industrial Hygiene Association Annual Meeting, held in Detroit, Mich., on 13 Apr 61.

Descriptors: (*Pyrenes, *Gas sampling), (*Air pollution, Pyrenes).
Identifiers: *Benzopyrenes, *Air pollution detection.

The extent to which benzo (a)pyrene and other polynuclear hydrocarbons are emitted to the atmosphere from some of the more commonly occurring suspect sources is currently being evaluated in a source sampling study by the Public Health Service. A first step in this study was the development of a technique for collecting samples from high temperature combustion and process gas streams in a manner which would assure retention of the hydrocarbon materials of interest. This paper reports the findings of a series of tests conducted to develop suitable methods for cooling the gas samples, to establish temperature requirements for the collected sample during the sampling period, and to evaluate wet versus dry collection techniques. (Author)

PB-214 955
National Center for Urban and Industrial Health, Cincinnati, Ohio.
METHODS OF MAKING SANITATION RATINGS OF MILKSHEDS. REVISED.

Oct 66, 42p PHS-Pub-678

Descriptors: (*Milk, *Food sanitation).

Separate procedures are given for making computations for (1) entire community milk supplies or (2) for individual dairy farm milksheds, receiving or transfer stations, or milk processors who ship their products, either interstate or intrastate into other milk control jurisdictions. Procedures for (1) above are given under Part I, The Public Health Service Rating Method for Community Milk Supplies, and the procedures for (2) above under Part II, The Public Health Service Rating Method for Individual Milk Supplies. (Author)

PB-214 956
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
LIGHT-SCATTER INSTRUMENTATION FOR MEASUREMENT OF ATMOSPHERIC PARTICLES,
John S. Nader, Gordon C. Ortman, and Morgan T. Massey. 1960, 26p
Prepared in cooperation with North Carolina Univ., Raleigh. Presented at the American Industrial Hygiene Association Annual Meeting held at Rochester, N.Y. on 27 Apr 60.

Descriptors: (*Particles, *Photometers), (*Air pollution, Particles), Light scattering.
Identifiers: *Air pollution detection.

Atmospheric particulates consist of solid particles and liquid droplets ranging in size from millimicrons to tens of microns and varying shape from spherical fog droplets to porous and irregular soot particles. Particulates are considered pollutants inasmuch as they can reduce visibility, cause property damage, and produce toxic effects both in man and plant life. Instrumentation is necessary, to evaluate the contribution of man-made particulates to the air pollution problem, the nature of various particles and their correlation to specific effects, and the effectiveness os specific control measures. The report discusses the photoelectric measurement of light scattered by particulate. The method offers a sensitive method of analysis without some of the drawbacks of sample collection.

PB-214 957
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN ATLANTA INTERSTATE AIR QUALITY CONTROL REGION (GEORGIA).

Jan 70, 72p APTD-1192

Descriptors: (*Georgia, *Air pollution).
Identifiers: *Atlanta (Georgia), *Air quality data.

The Clean Air Act as amended directs the Secretary of Health, Education, and Welfare to designate 'air quality control regions' to provide a basis for the adoption of regional air quality standards and the implementation of those standards. The Act stipulates that the designation of a region shall be preceded by consultation with appropriate State and local authorities. The report is intended to provide the basic background information needed for the consultation. In addition, on the basis of the information developed, the report proposes boundaries for the factors underlying the proposed boundaries. (Author)

PB-214 958
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
A TECHNICAL SEMINAR ON NUTRIENT REMOVAL AND ADVANCED WASTE TREATMENT HELD IN LLOYD CENTER AUDITORIUM IN PORTLAND, OREGON ON FEBRUARY 5-6, 1969 AND SPONSORED BY THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, NORTH WEST REGION.

1969, 222p

Descriptors: (*Sewage treatment, Nutrients), (*Chemical removal (Sewage treatment), *Nutrients), Nitrogen, Phosphorus.
Identifiers: *Physical chemical treatment.

The report considers the general chemistry of nitrogen and phosphorus from a nutrient and waste treatment and control standpoint.

PB-214 960/7
San Diego City, Calif.
BALING SOLID WASTE TO CONSERVE SANITARY LANDFILL SPACE; A FEASIBILITY STUDY.
Final rept.

1973, 98p* EPA-SW-44D-73
Grant PHS-EC-00061

Descriptors: (*Waste disposal, *Baling), (*Compacting, Waste disposal), Feasibility, Earth fills, Balers, Refuse disposal.
Identifiers: *Solid waste disposal, *San Diego (California), Waste transfer stations, *Sanitary landfills.

In addition to the purpose indicated by the title, the study was also designed to: (1) explore the possibilities of reducing direct haul distances; (2) study the use of solid waste bales as fill in reclaiming small canyons near residential areas; (3) compare the compaction obtained by baling with that achieved through conventional methods; (4) investigate baling as an integral feature of possible transfer station operations; (5) develop yardsticks, formulas, and techniques that might be useful to other communities in dealing with their solid waste collection and disposal problems. (Author)

PB-214 977/1
PEDCo-ENVIRONMENTAL, Cincinnati, Ohio.
STATEWIDE INVENTORY OF AIR POLLUTANT EMISSIONS STATE OF OHIO 1970 (REVISED).

14 Jan 72, 102p PEDCO-72-1 APTD-0756
Contract EPA-68-02-0044

Descriptors: (*Air pollution, *Ohio), Sources, Inventories, Tables (Data), Data acquisition, Particles, Sulfur dioxide, Carbon monoxide, Hydrocarbons, Nitrogen oxides, Combustion products, Exhaust gases, Coal, Natural gas, Fuel oil, Incinerators, Waste disposal, Evaporation, Solvents, Gasoline, Transportation, Electric power plants.
Identifiers: *Implementation Air Pollution Planning Program, Air Quality Control Regions, *Air quality data, Open burning, Automobile exhaust.

The results of an emissions inventory for the State of Ohio are presented. The purposes of the study were: (1) to determine the quantities of five air pollutants emitted in Ohio; (2) to calculate point and area source emission quantities; (3) locate sources on maps of gridded areas; (4) summarize and tabulate the results for use in developing an implementation plan for Ohio. The survey which included the entire State of Ohio concerned the following pollutants: particulates; sulfur oxides; nitrogen oxides; carbon monoxide; and hydrocarbons. Air pollution emissions were divided into eight source categories. The Universal Transverse Mercator System (UTM) was used as the reference system for grid delineation. (Author)

PB-214 978
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Lab. of Engineering and Physical Sciences.
METEOROLOGICAL RESEARCH IN AIR POLLUTION.

1965, 22p

Descriptors: (*Air pollution, *Atmospheric motion).

The report describes meteorological conditions contributing to air pollution and delineates methods used to forecast adverse pollution potentials.

PB-214 979
Public Health Service, Cincinnati, Ohio.
AIR POLLUTION IN GEORGIA...A COOPERATIVE STATE WIDE SURVEY,
Rudolph P. Lewis, Samuel B. McKee, Frank A. Bell, jr., and Horace S. Carter. Apr 62, 36p
Prepared in cooperation with Georgia Dept. of Public Health, Atlanta.

Descriptors: (*Air pollution, *Georgia), Surveys, Reviews, Project planning, Urban areas, Factor analysis, Policies, Cooperation, Legislation.

Emission of air pollutants has been increasing in Georgia from a variety of sources including automotive vehicles, burning refuse dumps, home and commercial heating plants and other sources, in addition to industrial sources. These increased emissions have resulted in a mounting number of air pollution problems. Therefore, a statewide survey was undertaken to provide a current assessment of air pollution in Georgia and to develop recommendations for necessary action.

PB-214 980
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
DETROIT RESERVOIR WATER QUALITY DATA REPORT, JUNE 1965-DECEMBER 1965.
Jan 66, 56p Working Paper-58
Report on Columbia River Basin Comprehensive Project for Water Supply and Pollution Control.

Descriptors: (*Water pollution, *Detroit Reservoir), (*Michigan, Water pollution).
Identifiers: *Water quality data.

A cooperative water quality study between the Federal Water Pollution Control Administration and the U.S. Army Corps of Engineers was initiated in June 1964. The surveys, conducted on a monthly schedule, were aimed at determining any significant changes in water quality attributed to the effects of storage or the seasonal variance of reservoir operations. The report contains a description of methods and procedures employed and the raw data collected. (Author)

PB-214 981
Environmental Health Center, Cincinnati, Ohio.
GROUND GARBAGE AND HOUSEHOLD SEPTIC TANK SYSTEMS,
S. R. Weibel. 1950, 14p
Presented at the Annual Meeting of the American Society of Sanitary Engineering at San Antonio, Texas, (Refresher Course), 9 Oct 50.

Descriptors: (*Septic tanks, *Garbage disposal).
Identifiers: *Garbage grinders.

The report describes the effects of ground garbage on household septic tanks and the soils surrounding the tanks.

PB-214 982
Bureau of Water Hygiene, Cincinnati, Ohio.
COMMUNITY WATER SUPPLY STUDY. ANALYSIS OF NATIONAL SURVEY FINDINGS.

Jul 70, 127p
See also PB-215 198.

Descriptors: (*Water supply, *Water quality), (*Water pollution, Water supply), (*United States, Water supply), Public health.

To investigate public water supply systems in the United States, the Bureau of Water Hygiene, Environmental Health Service, of the Public Health Service, with the cooperation of state and local health departments, and water utilities, conducted a nationwide Community Water Supply Study (CWSS) during 1969 in eight geographically distributed Standard Metropolitan Statistical Areas and the State of Vermont. The study included 969 water supply systems serving about 18.2 million people and was designed to assess: The status of drinking water quality; Water supply system facilities; Bacteriological surveillance programs in urban and suburban areas in nine regions of the country. (Author)

PB-214 983
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
CHEMICAL FLOCCULATION OF MICROORGANISMS IN BIOLOGICAL WASTE TREATMENT,
Mark W. Tenney, and Werner Stumm. Oct 65, 20p
Presented at the Annual Purdue Industrial Waste Conference (19th), held at Purdue Univ., Lafayette, Ind., on 5-7 May 64. Pub. in Jnl. of Water Pollution Control Federation, v37 n10 p1370-1388 Oct 65.

Descriptors: (*Sewage treatment, *Flocculating), Dissolved organic matter.

Chemical treatment of wastes, despite early interest in such methods, fell into disfavor as improved biological methods were developed. Biological treatment is far superior to chemical treatment for the removal of soluble organic matter. However, in recent years there has been a revived interest in special applications of chemical methods, especially for processing biologically treated effluents when additional purification is needed. This research was undertaken to investigate to what extent chemical flocculation methods can complement, and partially substitute for, the biological treatment process.

PB-214 984
Public Health Service, Washington, D.C.
REFUSE COLLECTION AND DISPOSAL FOR THE SMALL COMMUNITY,
William A. Xanten, and Ralph J. Van Derwerker. Nov 53, 46p
Prepared in cooperation with the American Public Works Association, Chicago, Ill.

Descriptors: (*Communities, Waste disposal), (*Waste disposal, Planning).
Identifiers: *Solid waste disposal.

Surveys have shown that many small communities do not follow sanitary refuse practices. There are many reasons why these communities have not taken steps to protect the health and welfare of their citizens. Predominant among the basic causes, however, is the belief that adequate service is too expensive, and a lack of information on how to establish and operate a satisfactory system. It has been clearly demonstrated many times, that urban fly control and rodent control must be based upon adequate storage, collection, and disposal of community wastes. A practical refuse control program is within the means of any community. This publication proposes to describe certain factors which needs to be considered in establishing sanitary refuse practices, and to present representative operational and cost data in such manner that they may be interpreted to meet local conditions.

PB-214 985
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
REPORT ON WATER POLLUTION CONTROL, SANTA ANA RIVER BASIN, CALIFORNIA DRAINAGE BASIN.

1 Mar 51, 124p PHS-Pub-18

Descriptors: (*Water pollution, *Santa Ana River Basin), (*California, Water pollution).
Identifiers: *Water quality data, Riverside County (California), San Bernardino County (California), Orange County (California).

The Basin contains 46 sewered communities with a connected population of approximately 337,000 discharging wastes to the ocean, land disposal systems, dry watercourses, or to surface streams. Known industrial wastes with a population equivalent of 360,000, discharged to the Orange County Joint Outfall Sewer, increase this total to 697,000. Community waste treatment facilities serving the 46 sewered communities reduce the population equivalent of the combined domestic and industrial wastes from 697,000 to approximately 360,000. Of this total, 324,000 is discharged to tidal waters or directly to the ocean and 28,000 is discharged to land.

PB-214 986
Ohio Univ., Athens. Dept. of Civil Engineering.
PERFORMANCE OF THE SOMERSET OXIDATION DITCH,
Harry M. Kaneshige. 1969, 19p
Presented at the Annual Meeting of the Ohio Water Pollution Control Conference (43rd), held at Toledo, on 19 Jun 69. Sponsored in part by Federal Water Pollution Control Administration, Washington, D. C.

Descriptors: (*Sewage treatment, *Lagoons (Ponds)), Channels (Waterways).
Identifiers: *Aeration ponds, Somerset (Ohio).

The oxidation ditch plant at Somerset, Ohio was studied for three years, June 1966 to May 1969. Objectives of the project were (1) to determine design criteria for oxidation ditches, based upon an evaluation of a full-scale plant and (2) to determine desirable operational procedures for optimum performance of these treatment units. To accomplish these objectives, systems analysis techniques were to be employed as the tool. (Author)

PB-214 987
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
EFFECTS OF THE 1956 STEEL STRIKE ON AIR POLLUTION LEVELS IN SEVERAL COMMUNITIES,
Elbert C. Tabor, and James E. Meeker. 1958, 30p
Presented at the Annual Meeting of the Air Pollution Control Association held in Philadelphia, Pa., on 26-29 May 58.

Descriptors: (*Iron and steel industry, Air pollution), (*Air pollution, *Industrial wastes), Strikes.
Identifiers: *Baseline measurements, *Air quality data, *Homestead (Pennsylvania), *Pittsburgh

(Pennsylvania), *Birmingham (Alabama), *Donora (Pennsylvania), *East Chicago (Illinois), *McKeesport (Pennsylvania).

The paper reports the results of a study conducted in several steel producing communities during and immediately following the steel strike of July, 1956. Since the decision to undertake this study was made the day after the strike started, measurement of pollutant levels under normal operating conditions had to be made after the strike was settled and the plants were once again operating at full capacity. With only a short time available to prepare for the sampling program, the study was limited to the following communities: Homestead, McKeesport, Pittsburgh, and Donora, Pa.; East Chicago, Ind.; and Birmingham, Ala. (Author)

PB-214 988
Oregon State Univ., Corvallis. Dept. of Chemistry.
VALENCE ISOMERIZATION OF DIHYDROPYRIDINES.
Terminal progress rept. 1 Jan 65-31 Aug 67,
Elliot N. Marvell. 31 Aug 67, 28p
Grant PHS-WP-0079

Descriptors: (*Pyridines, *Cyclization), Organic salts.
Identifiers: *Pyridinium compounds.

An investigation of the mechanism of the formation of phenylpyridinium ion from Konig's salt has been carried out. The rate of ring closure in methanol solution was increased by added base. An increase of base concentration increased the rate only up to the point at which the base concentration was equivalent to the salt concentration. The effect was independent of the nature of the base. A mechanism was postulated involving a rate determining valence isomerization of the free base derived from Konig's salt to a dihydropyridine. Similar results were shown to pertain with substituted Konig's salts. Rates were measured for methyl, methoxyl, chloride and fluorine containing salts. As a part of the mechanism a folding and unfolding process for the triene chain of the salt was proposed.

PB-214 989
Environmental Health Center, Cincinnati, Ohio.
INDUSTRIAL WASTE SURVEY REPORT.

1953, 20p
Prepared in cooperation with Detroit Sulphite Pulp and Paper Co., Detroit, Michigan.

Descriptors: (*Water pollution, *Detroit River), (*Michigan, Water pollution), Paper industry, Industrial wastes.

The report describes a survey conducted to determine the characteristics of the process wastes discharged from a pulp and paper company to the Zug channel of the Detroit River. This project was a part of the continuing study of boundary waters pollution being conducted for the International Joint Commission. (Author)

PB-214 990
Columbia Univ., New York. Dept. of Chemical Engineering.
CATIONIC POLYMERS AS FLOCCULANT AIDE IN WATER PURIFICATION.
Terminal progress rept.,
H. Linford, R. Fyfe, W. Hilborn, and S. Lausangngam. 1968, 122p
Grant PHS-WP00240-06

Descriptors: (*Water treatment, *Flocculating), (*Silicon dioxide, *Flocculants), (*Zeta potential, Flocculating), Inorganic polymers.

According to some investigators, the flocculation mechanism is based on action of chemical bonding forces. Little emphasis has been placed on the possibility that the flocculant might alter the make-up of the double layer thereby reducing electrostatic repulsive forces between particles and flocs. Behavior of the calculated electrokinetic or 'Zeta' potential reflects change in the stability of a suspension. Flocculation behavior can therefore be correlated with a Zeta potential. One means of estimating the Zeta potential is from microelectrophoresis measurements. The report shows that, by measuring the floc bed depth and total electrical resistance of the streaming potential cell, as well as the streaming potential and its corresponding pressure difference driving force, a control factor, valid over the potable water range, can be calculated for each flocculation system investigated. (Author)

PB-214 991
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Field Station.
WATER QUALITY SURVEY IN THE NORTH BRANCH - POTOMAC RIVER BETWEEN CUMBERLAND AND LUKE, MARYLAND, AUGUST, 1967.
Apr 68, 12p

Descriptors: (*Potomac River Basin, *Water pollution), (*Maryland, Water pollution), (*West Virginia, Water pollution).
Identifiers: *Water quality data.

The Chesapeake Field Station of the Middle Atlantic Region, Federal Water Pollution Control Administration, conducted an intensive survey of the North Branch Potomac River Basin between Bloomington and Cumberland, Maryland, during August 1967 (see Figure 1). The purpose of the survey was to aid in verifying the model DO and BOD parameters. The survey should also show the extent of any diurnal water quality fluctuations including the effects of mine drainage. (Author)

PB-214 992
Public Health Service, Cincinnati, Ohio. Div. of Water Supply Pollution Control.
WATER POLLUTION IN THE CENTRAL MISSOURI RIVER BASIN.
Water pollution series.

Jun 52, 69p PHS-Pub-130, PHS-WPS-24

Descriptors: (*Missouri River Basin, *Water pollution), (*South Dakota, Water pollution).

The report presents information concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect and those which appear to be needed for the Central Missouri River Basin.

PB-214 993
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ENGINE MODIFICATIONS AND EXHAUST EMISSION CONTROL: A SURVEY AND APPRAISAL.
Technical rept.,
W. E. Meyer. 1962, 55p SEC-TR-A62-8
Prepared in cooperation with Pennsylvania State Coll., State College.

Descriptors: (*Air pollution, *Exhaust gases), (*Automobile engines, Design), Reviews.
Identifiers: *Air pollution abatement.

In the report the possibilities of solving the exhaust emission problem of motor vehicles by means other than afterburning devices are reviewed and evaluated as far as current knowledge and available information permits. These possibilities range from minor changes through major modifications of the conventional gasoline engine to diesel engines, new types of power plants, new transmissions, and other alternatives. (Author)

PB-214 994
California Univ., Berkeley. Sanitary Engineering Research Lab.
THE FATE OF ABS IN SOILS AND PLANTS,
Stephen A. Klein, David I. Jenkins, and P. H. McGauhey. Oct 62, 53p

Descriptors: (*Irrigations, *Sewage disposal), (*Water pollution, *Detergents), (*Surfactants, Plant growth), (*Benzenesulfonic acids, *Plant growth), Plant physiology.
Identifiers: *Sewage irrigation, Liquid waste disposal, *Water pollution effects (Plants).

Two species of plants (sunflowers and barley) were grown in water culture at ABS concentrations of 0, 10, and 40 mg/1, and three species (sunflower, barley, and Lupinus albus) in soil at ABS concentrations up to 50 mg/1 to determine the effect of ABS on plant growth and the uptake of ABS by plants. The major findings of these experiments were that although ABS caused severe growth inhibition in water culture studies (about 70 percent at 10-mg/1 ABS and almost 100 per cent at 40-mg/1), only one species (sunflower) of the three species grown in soil was adversely affected. Furthermore, plants irrigated with sewage containing from 4.6- to 12.7-mg/1 ABS far surpassed in growth those irrigated with water, regardless of soil fertilization practices or the addition of up to 15-mg/1 ABS to sewage. It may be concluded, therefore, that irrigation with sewage is beneficial to plants in spite of the presence of ABS in any amount likely to occur in sewage at the present time. (Author)

PB-214 995
Public Health Service, Dallas, Tex. Region VII.
WATER RESOURCES STUDY. RUNNING WATER DRAW WATERSHED, BRAZOS RIVER BASIN, TEXAS AND NEW MEXICO.

Aug 64, 23p

Descriptors: (*Running Water Draw, *Water resources), (*Texas, Water resources), (*New Mexico, Water resources).

The purpose of the study was the determination of water requirements for municipal and industrial, and water quality control purposes to the year 2070 in the Running Water Draw watershed in the southern high plains of Texas and New Mexico. A suggested plan of development of the water resources of the watershed is also included. This plan utilizes water imported from Sanford Reservoir in the Canadian River basin and conservation of the watershed's ground water resources. (Author)

PB-214 996
Pacific Southwest Inter-Agency Committee, Sacramento, Calif. Water Management Subcommittee.
FUTURE NEEDS FOR HYDROLOGIC DATA,
Elmo W. Huffman, Robert B. Hickok, and Eugene L. Peck. Jul 68, 24p

Descriptors: (*Hydrometeorology, *Southwestern United States), Questionaires.

The report on Future Needs for Hydrologic Data was prepared by the Water Management Subcommittee of the Pacific Southwest Inter-Agency Committee to help water resource agencies in the Pacific Southwest improve the effectiveness and efficiency of their hydrologic data programs. It is based on the responses on 732 questionnaires from planners, designers, administrators, operators, and researchers representing nearly all, if not actually all, of the water resource agencies and companies in the region. (Author)

PB-214 997
Northwestern Univ., Evanston, Ill. Dept. of Civil Engineering.
AN ATLAS OF ACTIVATED SLUDGE TYPES,
Wesley O. Pipes. Dec 68, 148p

Grant FWPCA-WP-00588-04

Descriptors: (*Activated sludge process, *Microorganisms), Inventories.

Contents:
List of tables;
The atlas;
Information from Microscopic Examination of Activated Sludge;
Microscopic Appearance of Sludge;
Description of Sludge Types.

PB-214 998
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Field Station.
THE POTOMAC ESTUARY STATISTICS AND PROJECTIONS,
Johan A. Aalto. 1968, 15p
Presented at the Winter Public Meeting of the Interstate Commission on the Potomac River Basin at Fredericksburg, Va. 29 Feb 68.

Descriptors: (*Water pollution, *Potomac River), (*District of Columbia, Water pollution), (*Virginia, Water pollution), (*Maryland, Water pollution), Dissolved gases, Oxygen.
Identifiers: *Washington Metropolitan Area.

The report briefly discusses the water quality (primarily dissolved oxygen) of the Potomac in the Washington area.

PB-214 999
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ANIMAL INFESTATIONS IN DISTRIBUTION SYSTEMS,
William MarcusIngram, and Kenneth M.Mackenthun. 1962, 17p

Descriptors: (*Water pollution, *Aquatic animals), (*water supply, Water supply), Aquatic plants, Food chains, Waterworks, Nematoda, Worms, Diptera, Crustacea, Reservoirs.

Animals that have been reported in distribution systems and of special interest to the water works operator, and in certain instances to the consumer, are nematodes (roundworms), mollusks (snails and clams) midge larvae (bloodworms), and crustacea (copepods and water fleas). Other animals causing occasional nuisances in distribution systems are: protozoa, sponges, rotifers, bryozoans, segmented worms, and aquatic sow bugs (water lice), to name some examples. The report quickly reviews this problem.

PB-215 004
Public Health Service, Cincinnati, Ohio. Water and Sanitation Investigations.
A STUDY OF THE OPERATION OF THE MECHANICAL ACTIVATED SLUDGE PLANT AT BAER FIELD, INDIANA,
C. C. Ruchoft, R. S. Smith, and W. A. Moore. Dec 45, 18p

Descriptors: (*Sewage treatment, Activated sludge process), (*Packaged sewage plants, Performance evaluation).

The report describes a study performed on a sewage treatment plant, physically located on a military installation, in order to ascertain the suitability for adaptation of such a system to small town usage.

PB-215 005
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
BIG SIOUX RIVER DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
Oct 51, 49p PHS-Pub-127, PHS-WPS-21

Prepared in cooperation with Iowa Dept. of Health, Minnesota Dept. of Health, South Dakota State Dept. of Health.

Descriptors: (*Big Sioux River Basin, *Water pollution), (*Iowa, Water pollution), (*Minnesota, Water pollution), (*South Dakota, Water pollution).

An effort is made to present a fair picture of the complex water pollution problems in the Big Sioux Basin and to present reasonable conclusions and recommendations.

PB-215 006
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
SAN JOAQUIN ESTUARY NEAR STOCKTON, CALIF. AN ANALYSIS OF THE DISSOLVED OXYGEN REGIMEN,
Richard C. Bain, Jr., William H. Pierce, and Albert Katko. May 68, 48p

Descriptors: (*San Joaquin River, *Dissolved gases), (*Water pollution, San joaquin River), (*California, Water pollution), Oxygen, Phytoplankton, Estuaries.
Identifiers: *Water quality data.

The report presents data and relationships derived from a survey of the waters of the San Joaquin River Estuary near Stockton, California. Dissolved oxygen levels were measured on eight cruises from mid-July to the end of October, 1964. Each cruise included sampling during a low tide slack during the late afternoon and during the following pre-dawn period. Phytoplankton populations, nutrient level and water temperatures were also obtained at seven river stations and the Stockton Sewage Treatment Plant effluent. The pollution problems of the Stockton area are characterized and explained in part by the data from this brief study. (Author)

PB-215 007
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION FROM ALFALFA DEHYDRATING MILLS.
Technical rept.

1960, 29P SEC-TR-A60-4

Descriptors: (*Agricultural wastes, *Air pollution), (*Food processing, Air pollution), (*Grains (Food), Air pollution).
Identifiers: *Alfalfa.

In cooperation with the Kansas State Board of Health and the American Dehydrators' Association, the Air Pollution Engineering Program of the U.S. Public Health Service conducted an evaluation of atmospheric emissions from alfalfa dehydrating mills. The report discusses the quantity and size distribution of dust discharged to the atmosphere from these mills, as determined by a study of a group of representative plants in Kansas and Ohio. It also discusses dust collection practices at typical plants and the relationship between these dust collection practices and the protein and carotene (pro-Vitamin A) content of the meal produced.

PB-215 008
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SHELLFISH SANITATION RESEARCH. PROCEEDINGS OF THE 1959 PLANNING CONFERENCE.
Technical rept.,
C. B. Kelly. 1960, 47p SEC-TR-F60-3

Descriptors: (*Water pollution, Shellfish), (*Shellfish, Bacteria), (*Seafood, *Food sanitation), Public health, Food processing, Food contamination, Water pollution, Bacteriology, Proceedings.
Identifiers: *Water pollution effects (Aminals).

Contents:
Responsibilities of the Public Health Service in sanitary control of shellfish, Scope of problems in shellfish sanitation;
Problems as seen by a State Official;
The interests of the shellfish industry;
Proposed program of activities;
Studies on shellfish toxicity;
Responsibilities of the Public Health Service in sanitary control of shellfish;
Suggested procedure for evaluating the sanitary significance of 'fecal coliform organisms' in shellfish and shellfish waters.

PB-215 009
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
WASTEWATER SOLIDS PROCESS TECHNOLOGY FOR ENVIRONMENTAL QUALITY IMPROVEMENT,
James E. Smith, Jr. Dec 70, 35p

Descriptors: (*Sludge disposal, *Reviews), Alums, Activated sludge process, Coagulation, Filtration, Lagoons (Ponds).
Identifiers: *Sludge treatment.

A review of problems confronted in disposing of sludges from municipal wastewater treatment plants is presented. The quantities and characteristics of these sludges that must be dealt with are enumerated. Waste sludges originating from the activated sludge and tertiary treatment processes together with alum sludges are typically high in moisture and gelatinous in nature and are shown to present the greatest challenge in dewatering. Each of a variety of biological, chemical and physical treatment alternatives is discussed. Recently completed in-house research is noted. This includes the optimization of the aerobic stabilization process, the use of organic polymers and various inorganic additives including iron and sludge incinerator ash on sludge filtration and thickening. (Author)

PB-215 010
Environmental Health Center, Cincinnati, Ohio.
STUDIES ON HOUSEHOLD SEWAGE DISPOSAL SYSTEMS,
S. R. Weibel. Aug 52, 22p
Presented at the Engineers' and Sanitarians' Session of the Annual Health Conference, Pennsylvania State Coll., 26 Aug 52.

Descriptors: (*Septic tanks, Design criteria).

The report describes the design and functional characteristics of a residential septic tank system and the anaerobic digestion of sewage within such a system.

PB-215 011
Robert S. Kerr Water Research Center, Ada, Okla.
INDUSTRY-GOVERNMENT COOPERATIVE RESEARCH FOR WATER POLLUTION CONTROL,
Curtis C. Harlin. 1969, 7p
Presented at American Inst. of Chemical Engineers Workshop-entitled Industrial Process Design for Water Pollution Control, Houston, Tex. 24-25 Apr 69.

Descriptors: (*Water pollution, *Government policies), (*Grants, Water pollution), National government.

The Federal Government's policy regarding water pollution is presented. The various types of grants and contracts administered by the Federal Water Pollution Control Administration are discussed. Those grant programs which are directly related to industrial waste problems are explained.

PB-215 012
Maine Univ., Orono.

USE OF CHEMICAL ADDITIVES TO IMPROVE AERATION RATES. STUDY OF MODELS OF AIR DISPERSERS.
Progress rept. no. 3b,
Stefan A. Zieminski, and Richard R. Lessard.
1967, 32p R-848-4
FWPCA-WP-00562-04

Descriptors: (*Aerators, Improvement), Additives.

The investigation presented in the report deals with a method for improving the rates of aeration. In order to achieve this objective, small quantities of some organic substances were introduced in the zone of bubble formation. These additives decreased bubble coalescence and improved the rate of transfer because of the substantial increase in the interfacial surface area. The tests were conducted with n-octanol, 4-methyl-2-pentanol and heptanoic acid. At a concentration of 1 ppm the n-octanol and 4-methyl-2-pentanol showed an improvement in the rate of aeration of 70 per cent over that in pure water. At a concentration of only 0.5 ppm n-octanol gave an improvement in the rate of transfer of 30 per cent. Since the design of the aerator and the agent were not optimized, it may be expected that still better effect could be obtained in a large scale installation. (Author)

PB-215 013
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN OKLAHOMA CITY INTRASTATE AIR QUALITY CONTROL REGION (OKLAHOMA).
Mar 70, 73p APTD-1186

Descriptors: (*Oklahoma, *Air pollution).
Identifiers: *Oklahoma City (Oklahoma), *Air quality data.

The report is intended to provide the basic background information to provide a basis for the adoption of regional air quality standards and the implementation of those standards. It proposes boundaries for the Oklahoma City Intrastate Air Quality Control Region and discusses the factors which are the basis of the proposed boundaries. (Author)

PB-215 014
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BACTERIAL ACCUMULATION BY THE OYSTER, CRASSOSTREA VIRGINICA, ON THE GULF COAST,
Technical rept.,
C. B. Kelly, W. Arciaz, M. W. Presnell, and E. K. Harris. 1960, 49p SEC-TR-F60-4

Descriptors: (*Food contamination, Oysters), (*Oysters, *Bacteria), (*Shellfish, Bacteria), (*Water pollution, Shellfish), Sea water, Temperature, Chlorination, Ultraviolet radiation, Decontamination, Food sanitation, Florida, Accumulation.
Identifiers: Crassostrea virginica, *Water pollution effects (Animals).

A series of laboratory experiments were conducted at Pensacola, Florida to determine the rate of accumulation of bacteria by the eastern oyster, Crassostrea virginica. These studies involved the determination of the coliform level attained by oysters in laboratory flats furnished flowing sea water artificially polluted by the continuous addition of suspensions of coliform organisms. The tests were conducted simultaneously at two levels of bacterial density of the water, which correspond to the coliform MPN limits set for moderately polluted and approved shellfish growing areas. A third flat, furnished with coliform-free sea water, was included as a control.

PB-215 015
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PHENOL IN RELATIONSHIP TO TASTE AND ODOR PROBLEMS,
M. B. Ettinger. 1958, 11p

Descriptors: (*Water pollution, Taste), (*Odors, Water pollution), (*Phenols, Water pollution), (*Water supply, *Taste).

The report considers the taste and odor of water used in the home. It should be acceptable to at least 95 per cent of the using population, regardless of whether the water is newly pumped from the treatment plant or has been hung up in a reservoir en route. The effects of phenols in this problem are discussed.

PB-215 016
Sanitary Engineering Center, Cincinnati, Ohio.
RADIOACTIVE FALLOUT, WATER SUPPLY, AND AGRICULTURE,
Conrad P. Straub. 22 Sep 59, 20p
Presented at the Water for Texas Conference Held at Texas A and M College, College Station, Tex. 10 Sep, 1959.

Descriptors: (*Radioactive contaminants, *Environmental surveys), (*Fallout, Environmental surveys), Radiobiology, Water pollution.

Radioactive fallout represents nuclear debris deposited on the ground from the atmosphere. Although most fallout originates from tests of nuclear weapons, some may also arise from specific nuclear operations. Depending on the method of deposition, fallout is characterized as dustout--deposition of dry solids; rainout--carried by rainfall; or snowout--deposited by snowfall. The report disucsses the effects of fallout on water, plants and soils.

PB-215 017
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PRESSURE-BROADENING EFFECTS ON INFRARED PEAK INTENSITIES OF HYDROCARBONS,
A. P. Altshuller, and A. F. Wartburg. 1957, 15p

Descriptors: (*Hydrocarbons, *Infrared spectra), (*Gas analysis, Hydrocarbons).
Identifiers: *Line broadening.

The pressure-broadening effects of one atmosphere of air or of carbon dioxide on various infrared bonds of hydrocarbons have been measured and compared with the intensity data obtained without pressure-broadening. Measurements have been made on the following hydrocarbons at partial pressures between 0.5 and 20 millimeters and at the following wavelengths: ethylene, 10.52 microns; acetylene, 3.1, 7.4 and 13.7 microns; propylene, 10.95 microns; butene-1, 10.85 microns; trans-2-butene, 10.375 microns; and benzene, 9.50 microns. The variation of optical absorbance at several of the infrared absorption maxima of ethylene and acetylene have been investigated using varying partial pressures of air or carbon dioxide at fixed partial pressures of the two hydrocarbons. (Author)

PB-215 018
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SUBURBAN SEWAGE TREATMENT BY THE ANAEROBIC CONTACT PROCESS,
J. L. Witherow, J. B. Coulter, and M. B. Ettinger. Dec 57, 25p

Descriptors: (*Sewage treatment, *Anaerobic processes), Contacting.

Substantial removal of organic matter from raw sewage by the anaerobic contact process is demonstrated by laboratory and pilot plant tests.

PB-215 019
Public Health Service, Washington, D.C. Div of Environmental Engineering and Food Protection.
SHELLFISH INDUSTRY. EQUIPMENT CONSTRUCTION GUIDES,
Lee Roy Lunsford. Apr 62, 10p PHS-Pub-943

Descriptors: (*Shellfish, *Food industry), (*Seafood, *Food sanitation), Food processing, Public health, Fisheries.

The guide covers the sanitary construction aspects of (1) shellfish blower tanks, including the sanitary piping for air, water, and drain lines, (2) the stand-supported skimmer, including the supporting stand, (3) returnable shipping containers, (4) shellfish shucking buckets, and (5) shellfish shucking pans.

PB-215 020
Environmental Health Center, Cincinnati, Ohio.
WATER POLLUTION CONTROL POLICY,
Paul D. Haney. 1953, 23p
Presented at the Miami Beach Meeting of the American Society of Civil Engineers, 16-19 Jun 53.

Descriptors: (*Government policies, *Water pollution).

Historically, water pollution control has been associated with the protection of public health, and now there is a definite trend in the direction of considering the effects of pollution on all water uses. Certain policies have been defined in the Water Pollution Control Act of 1948, others are implied, and others have been developed by the Public Health Service as required for program operation. Major policies in connection with the national water pollution control program are discussed. (Author)

PB-215 021
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
PROGRESS AND POSSIBILITIES IN SEWAGE TREATMENT RESEARCH,
J. K. Hoskins. 1938, 18p

Descriptors: (*Sewage treatment, *Aquatic microbiology).

It is not the intention of the report to point out all the deficiencies in the knowledge of sewage treatment biology, chemistry and operation but rather to mention some of the advances that have been made in practical experimentation and to discuss somewhat more fully some of the phases of research on the natural purification processes of polluted water and sewage.

PB-215 022
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
ALABAMA RIVER BASIN (INCLUDING THE COOSA, TALLAPOOSA AND CAHABA RIVER BASINS).
Jan 54, 66p
Prepared in cooperation with Alabama Water Improvement Advisory Commission Tennessee Stream Pollution Control Board.

Descriptors: (*Alabama River basin, *Water pollution), (*Alabama, Water pollution), (*Georgia, Water pollution).

The reports present information about the ways the water resources of the area are used, the pollution entering these water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, pollution prevention measures now in effect, and those which appear to be needed. (Author)

PB-215 023
Public Health Service, Dallas, Tex. Region VII.

STORAGE FOR WATER QUALITY CONTROL MANGUM PROJECT SALT FORK OF RED RIVER.
Mar 63, 27p
Prepared in cooperation with Bureau of Reclamation, Washington, D.C., and Oklahoma City Development Office, Okla.

Descriptors: (*Red River basin, *Water pollution), (*Oklahoma, Water pollution).
Identifiers: *Jackson County (Oklahoma), *Greer County (Oklahoma).

The report presents water requirements for water quality control purposes to the year 2012 in the Salt Fork of the Red River basin together with an estimate of annual benefits ascribable to storage allocated at the proposed Mangum Project site for this purpose. (Author)

PB-215 024
Federal Water Pollution Control Administration, Washington, D.C.
WATER POLLUTION CONTROL ACT AND OIL POLLUTION ACT, 1924, AS AMMENDED 1966.

1967, 36p

Descriptors: (*Water pollution, *Legislation), Public law, Regulations.
Identifiers: *Oil pollution.

The report sets forth the provisions of the Water Pollution Control Act and the Oil Pollution Act.

PB-215 025
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN FARGO-MOORHEAD INTERSTATE AIR QUALITY CONTROL REGION (NORTH DAKOTE-MINNESOTA).

Jul 70, 66p APTD-1199

Descriptors: (*North Dakota, *Air pollution), (*Minnesota, *Air pollution).
Identifiers: *Fargo (North Dakota), *Moorhead (North Dakota), *Air quality data.

The report is intended to provide the basic background information needed to provide a basis for the adoption of regional air quality standards and the implementation of those standards. It proposes boundaries for the Metropolitan Fargo-Moorhead Interstate Air Quality Control Region and discusses the factors which are the basis of the proposed boundaries. (Author)

PB-215 026
Public Health Service, Washington, D.C.
AIR POLLUTION RESEARCH SEMINAR (3RD), HELD IN NEW ORLEANS, LOUISIANA, ON 22--24 MARCH 1960.

1960, 92p

Descriptors: (*Air pollution, *Meetings).

Since passage by Congress of the first air pollution and Technical Assistance Act legislation in 1955, the Public Health Service has sponsored a series of conferences and seminars on air pollution research. These are designed to provide a national opportunity to appraise problems and progress in this field. The 1960 research seminar held in New Orleans, Louisiana, is reported.

PB-215 027
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PLANNING THE ORGANIZATION AND CONDUCT OF STREAM POLLUTION SURVEYS,
J. K. Hoskins. 1937, 13p
Presented at the Ohio Conference on Sewage Treatment, Cincinnati, Ohio. 19-20 October, 1937.

Descriptors: (*Water pollution, *Environmental surveys).

The report discusses what surveys of water pollution should include. The necessary information needs to ascertain the nuisance conditions, the water quality for drinking, the capacity for pollution, the ability to support aquatic animals, and health factors.

PB-215 028
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BIOLOGICAL AND CHEMICAL ASPECTS OF ORGANIC WASTE LAGOONS,
A. F. Bartsch. 1956, 26p
Pub. in Land Disposal of Liquid Waste, p61-86 1956, Paper F-8.

Descriptors: (*Sewage treatment, Lagoons (Ponds)), (*Photosynthesis, *Lagoons (Ponds)).
Identifiers: *Aeration ponds.

Growing popularity of waste stabilization ponds has created new interest in the pond mechanism and factors affecting it. Mode of action and impact of these factors influence design and resulting pond accomplishment. Of importance are photosynthetic oxygenation; interrelation of light penetration, algal density, and depth; the effect of temperature upon B.O.D. rate, D.O. saturation level, and photosynthesis; and the manner in which seasonal forces are superimposed upon daily fluctuation in pond characteristics. The relative influences of ice cover and loading pattern and the responses that follow are pointed out. (Author)

PB-215 029
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN SIOUX FALLS INTERSTATE AIR QUALITY CONTROL REGION (SOUTH DAKOTA-IOWA-MINNESOTA).

Jul 70, 63p APTD-1196

Descriptors: (*South Dakota, *Air pollution), (*Iowa, Air pollution), (*Minnesota, Air pollution).
Identifiers: *Sioux Falls (South Dakota), *Air quality data.

The basic background information is presented for the consultation with state and local authorities prior to the designation of air quality control regions as stipulated in the Clean Air Act. Boundaries for the regions are proposed and the factors which are the basis for the proposed boundaries are discussed. Reports for consultation consider these factors: geography; population and economic activity; their prospective growth; probable direction of physical growth; the emission inventory and the location of sources; air quality and pollution transport analysis; regional planning; air pollution control; and governmental jurisdictions. (Author)

PB-215 030
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
EVALUATION OF AIR POLLUTION IN THE STATE OF WASHINGTON.
Rept. for 1 Jul-30 Nov 56,
E. R. Hendrickson, D. M. Keagy, and R. L. Stockman. Dec 56, 175p
Prepared in cooperation with the State of Washington Department of Health.

Descriptors: (*Washington (State), *Air pollution).
Identifiers: *Air quality data.

The scope of the study was to assess the present and potential state problem and to delineate specific problem areas, present and future, through a study of population distribution and trends, geography and topography, meteorology and climatology, and existing and potential sources of pollution. In addition, a determination was made of available resources in the State for research and investigation in air pollution problems. The sources of pollution which are considered include transportation, domestic activities, agricultural practices, industrial activities, refuse disposal, out-of-state sources, and natural sources. (Author)

PB-215 031
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
SANTA MARGARITA PROJECT. WATER QUALITY CONTROL STUDY.

Mar 68, 37p
Report on Santa Margarita River Basin California.

Descriptors: (*Santa Margarita River Basin, *Water pollution), (*California, Water pollution).

The Santa Margarita Project in Southern California will develop approximately between 11,000 and 12,000 acre-feet of water annually for military, agricultural, industrial, and municipal uses. Because the downstream beneficial uses will be few, flow regulation for water quality control will not be needed below the project reservoirs. Nutrient-rich waste flows entering the project reservoirs from upstream developments are predicted to have a significant adverse impact on the quality of the impounded waters. The most feasible plan to alleviate this problem requires transport of wastes from the Upper Basin to areas below the two proposed reservoirs. A water quality management program for the entire basin is essential to the success of this project and to the ultimate development of the basin's water resources. (Author)

PB-215 032
National Center for Air Pollution Control, Durham, N.C.
SPECIFICATIONS FOR INCINERATOR TESTING AT FEDERAL FACILITIES.
Oct 67, 38p

Descriptors: (*Incinerators, Air pollution), Tests.

The following test procedures are recommended for use in determining whether an incinerator meets the air pollution emission standards of the Federal Code as detailed in the report. These test procedures are applicable to the following types of incinerators: multiple-chamber incinerators burning less than 2,000 pounds per hour of general refuse, multiple-chamber incinerators burning pathological waste, and single-chamber incinerators, except flue or chute fed incinerators, burning either general refuse or pathological waste.

PB-215 033
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR MONITORING AND SAMPLING NETWORKS. PROCEEDINGS OF THE 1959 SEMINAR.
Technical rept.
1960, 144P SEC-TR-A60-3
Proceedings of a seminar held at the Robert A. Taft Sanitary Engineering Center, Monday and Tuesday, November 23-24, 1959.

Descriptors: (*Air pollution, *Monitors), Meetings.
Identifiers: *Air pollution sampling.

Contents:
Seminar and network objectives;
National networks;
State and local networks;

Selection of sampling sites;
Equipping sampling stations;
Operation of stations;
Laboratory support;
Data handling and reporting;
Data analysis;
Use of data;
Interchange and release of data.

PB-215 041
Public Health Service, Cincinnati, Ohio.
WATER QUALITY STUDIES. BONNEVILLE RESERVOIR.

7 Apr 53, 44p PHS-CRS-8
Report on Columbia River Studies.

Descriptors: (*Bonneville Reservoir, *Water pollution), (*Washington (State), Water pollution), (*Oregon, Water pollution), (*Columbia River, Water pollution).
Identifiers: *Water quality data.

A study of the Bonneville Reservoir was carried out as a part of the Columbia River Studies project of the Public Health Service. Two main objectives of the overall program were to determine the effects of impoundments upon stream water quality and to determine the effects of radioactive materials upon the normal chemical, physical, and biological parameters of stream water quality.

PB-215 042
South Dakota State Dept. of Public Welfare, Pierre.
APPRAISAL OF AIR POLLUTION IN SOUTH DAKOTA.
Rept. for Oct 61-May 62,
E. Carl Charles, and G. Lee Christensen. Aug 62, 72p
Sponsored in part by - Public Health Service, Washington, D.C.

Descriptors: (*South Dakota, *Air pollution).

The objects of this survey were threefold: to determine the extent of air pollution in South Dakota; to evaluate presently available means for coping with the problem; and if necessary to recommend any steps required to restore and preserve the State's air resources. The State Department of Health requested the assistance of the United States Public Health Service in conducting this survey. Arrangements for the survey were completed in September 1961 and the survey itself, consisting of questionnaries, field inspections, and a review of existing information commenced in October 1961. (Author)

PB-215 043
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN MIAMI INTRASTATE AIR QUALITY CONTROL REGION (FLORIDA).
Mar 70, 59p APTD-1189

Descriptors: (*Florida, *Air pollution).
Identifiers: *Miami (Florida), Broward County (Florida), Dade County (Florida), Palm Beach County (Florida), *Air quality data.

The Clean Air Act, as amended, directs the Secretary of Health, Education, and Welfare to designate 'air quality control regions' to provide a basis for the adoption of regional ambient air quality standards and the implementation of those standards. The Act stipulates that the designation of a region shall be preceded by consultation with appropriate State and local authorities. This report is intended to provide background information for a formal Consultation. It proposes boundaries for the Metropolitan Miami Intrastate Air Quality Control Region and discusses the factors which are the basis of the boundary proposal. (Author)

PB-215 044
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE PHOENIX-TUCSON INTRASTATE AIR QUALITY CONTROL REGION (ARIZONA).

Sep 69, 59p APTD-1205

Descriptors: (*Air pollution, *Arizona).
Identifiers: *Phoenix (Arizona), *Tucson (Arizona), *Air quality data.

An air pollutant emissions inventory for eight counties in southern Arizona is reported.

PB-215 045
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE AIR QUALITY CONTROL REGION FOR THE NEW JERSEY-NEW YORK-CONNECTICUT INTERSTATE AREA.

30 Aug 68, 100p APTD-1195

Descriptors: (*Air pollution, *New Jersey), (*Air pollution, *Connecticut), (*Air pollution, *New York).
Identifiers: *Air quality data.

A study was made of the New Jersey-New York-Connecticut urban area. Air quality control region boundaries are proposed to provide a basis for the establishment of air quality standards and the implementation of air quality control program.

PB-215 046
Public Health Service, Cincinnati, Ohio, Div. of Water Supply and Pollution Control.
UPPER MISSOURI RIVER DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series

May 52, 52p PHS-Pub-131, PHS-WPS-25

Descriptors: (*Mississippi River basin, *Water pollution), (*Montana, Water pollution).
Identifiers: *Water quality data.

The report is based on data available as of January 1, 1952, on sources of pollution, treatment facilities employed, and stream conditions for the Upper Mississippi River basin. It also presents information concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect and those which are needed.

PB-215 047
Sanitary Engineering Center, Cincinnati, Ohio.
ORGANISMS ASSOCIATED WITH POLLUTION. (A SELECTION OF ILLUSTRATIONS),
H. W. Jackson. 1965, 20p

Descriptors: (*Aquatic biology, *Water pollution), (*Indicator species, Water pollution), Aquatic animals, Aquatic plants, Cyanophyta, Algae, Chlorophyta, Fungi, Protozoa, Platyhelminthes, Nematoda, Worms, Crustacea, Hemiptera, Diptera, Insects, Graphic arts.

The report presents pictures of the various aquatic organisms affected by water pollution.

PB-215 048
Rovert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WHAT HAS BEEN DONE, IS NOW BEING DONE, WILL BE DONE TO ELIMINATE AIR POLLUTION. THE ROLE OF THE FEDERAL GOVERNMENT,
Leslie A. Chambers. 1955, 13p

Presented at Southern California Conference on Elimination of Air Pollution, California State Chamber of Commerce, Los Angeles, California, November 19, 1955.

Descriptors: (*Air pollution, *Government policies), National government.

A review is presented of actions to eliminate air pollution before and during 1955, particularly in California. Actions include air sampling, research, and legislation.

PB-215 049
Environmental Health Center, Cincinnati, Ohio.
A WATER QUALITY SURVEY OF HAMPTON ROADS SHELLFISH AREAS,
Russell S. Smith. 1952, 18p
Presented at the Convention of The Oyster Institute of North America, Atlantic City, N. J., August 12-14, 1952.

Descriptors: (*Virginia, Water pollution), (*Hampton Roads, *Water pollution), (*Shellfish, Water pollution), (*Seafood, Water pollution), Public health, Food contamination, Water quality, Harbors, Atlantic Ocean.
Identifiers: *Water pollution effects (Animals).

The shallow water areas in and near Hampton Roads have always been one of the most important oyster growing sections of the country. The Roads are also one of the finest natural harbors on the Atlantic Coast. With the development of shipping in the area, the port cities of Norfolk, Portsmouth and Newport News grew and developed and, in accordance with customs of the times, discharged their sewage into the nearest body of water. The waters of the Hampton Roads area present an excellent example of the effect of sewage pollution on shellfish growing waters and the improvement possible by means of sewage treatment. As the pollution increased, the use of this great natural resource had to be subjected to ever-increasing restrictions. Finally, with collection and treatment of sewage, the quality of the waters has so improved that the restriction imposed could be removed over much of the area.

PB-215 050
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
A PRELIMINARY ANALYSIS OF WATER POLLUTION SURVEILLANCE SYSTEM PLANKTON DATA FOR THE NORTHWEST REGION.

Feb 69, 32p Working Paper-63

Descriptors: (*Pacific Northwest, Water Pollution), (*Plankton, Pacific Northwest), Water quality, Data, Surveys, Indicator species.

The purpose of this paper is to present a preliminary evaluation of plankton data collected in the Pacific Northwest Region and to make recommendations regarding the advisability of continuing this data collection for pollution surveillance purposes. Under the proper conditions, plankton data can be a useful parameter in itself; however, its present role is to lend support to chemical and physical data. These plankton data have provided almost ten years of 'badeline' data at certain points in the Northwest Region. At a later date, if needed, these data could prove to be of historic value if and when a comparison needed to be made between two periods of time to determine water quality changes.

PB-215 051
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
THE SULFAMIC ACID MODIFICATION OF THE WINKLER METHOD FOR DISSOLVED OXYGEN,
Stuart Cohen, and C. C. Ruchhoft. 1941, 15p

Descriptors: (*Dissolved gases, *Water analysis), Oxygen, Nitrites, Errors, Sulfamic acids.
Identifiers: *Winkler analysis, *Water pollution detection.

A modified Winkler procedure employing a solution of 4 percent sulfamic acid in 20 percent sulfuric acid as a preliminary treatment for the removal of nitrites in the dissolved oxygen determination has been presented. It has been shown that this procedure is as satisfactory as the azide modification for the determination of dissolved oxygen and biochemical oxygen demand in sewage treatment and river pollution studies. The two modifications, azide and sulfamic acid, were compared and appear to have equal value in the prevention of biochmeical oxidation when it is necessary to store a dissolved oxygen sample for a short time. (Author)

PB-215 052
Advisory Boards to the International Joint Commission on Control of Pollution of Boundary Waters.
INTERNATIONAL JOINT COMMISSION--UNITED STATES AND CANADA.

Apr 57, 22p

Descriptors: (*Great Lakes Region, *Water pollution).

The report is the Eleventh Progress Report to the International Joint Commission prepared by the Advisory Boards on Control of Pollution of Boundary Waters under reference in the Great Lakes Region. Emphasis is being placed on control and monitoring of industrial waste systems with the objective of preventing 'spills' and minimizing irregularities in operation. The programs established for investigating possible future fish kills and for warning water plant operators should keep those handling pollutional materials on the alert. Significant progress has been made by industry in providing waste treatment facilities, and treatment for all domestic sewage should soon be a reality.

PB-215 053
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER USES AND WATER QUALITY INTERFERENCES WITH WATER USES. SNAKE RIVER BASIN.
Sep 66, 45p Working Paper-60
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Snake River Basin, *Water quality), (*Water pollution, Snake River Basin), Fisheries, Wildlife.

This natural resource use study of the Snake River Basin was conducted in conjunction with a water quality investigation from August 22-28, 1966. The primary objective was to determine non-documented major water uses--at preselected locations--and to grosaly assess the suitability of the water environment to serve such uses. In general, terms such as 'high' (aesthetic value), 'heavy' (fisherman use), 'moderate,' 'light,' 'nil' or 'non-existent,' are used to delineate the degree of intensity of a use or of its quality.

PB-215 054
Sanitary Engineering Center, Cincinnati, Ohio.
ACTIVITIES BULLETIN. OHIO RIVER POLLUTION SURVEY. VOLUME 2, NUMBER 6, NOVEMBER - DECEMBER 1940.
Dec 40, 28p

Descriptors: (*Ohio River, *Water pollution).

Contents: Activities at field sub-stations, current laboratory operations, epidemiological studies, industrial wastes and the Ohio River pollution survey, low flow control measures in operation and proposed in the upper Ohio Basin, stream pollution studies in the Pacific Northwest, and acid mine drainage studies.

PB-215 055
Robert S. Kerr Water Research Center, Ada, Okla.
WATER POLLUTION CONTROL RESEARCH - SOUTH CENTRAL REGION,
Curtis C. Harlin, Jr. 1968, 11p
Presented at American Association for the Advancement of Science, Washington, D.C., 26 Dec 68.
Identifiers: *Robert S. Kerr Water Research Center.

The Robert S. Kerr Water Research Center located at Ada, Oklahoma, is the focal point for research within the South Central Region of the Federal Water Pollution Control Administration, U. S. Department of the Interior. Its research, investigations, experiments, field demonstrations and studies, and training relating to the prevention and control of water pollution are discussed.

PB-215 056
Utah State Univ., Logan.
SEQUENTIAL USE WITHIN A HYDROLOGIC COMPLEX.
Annual progress rept. no. 1, 1 Dec 65-31 Mar 67,
David W. Hendricks. 15 Mar 67, 20p
Grant WPD-17-01-66

Descriptors: (*Hydrology, Mathematical models).

The primary objective of the first year of operation of the project was to delineate the system in terms of model building requirements for a hydrologic-quality model. As implied by this objective, it was necessary to define the hydrologic and water quality characteristics of the system. This was done: (1) by collecting and collating previous data and reports, and (2) by implementing a data collection program to augment previous work. The secondary activity of the first year was in formulating plans for the model building phase of the project. These aspects are briefly discussed.

PB-215 057
Environmental Health Center, Cincinnati, Ohio.
EVALUATION OF DETERGENTS. V. A STUDY OF WASHING PERFORMANCE OF SOME SURFACE ACTIVE MATERIALS AND COMBINED DETERGENT-SANITIZERS,
Francis I. Norris, and C. C. Ruchhoft. 17 Apr 50, 13p
Presented at National Meeting of the American Chemical Society (117th), Detroit, Mich. 17-19 Apr 50.

Descriptors: (*Detergents, Performance evaluation), (*Quaternary ammonium salts, Detergents).

Previous studies indicated that in general surface active materials improved the washing performance of alkaline detergents even though the same surface active agents were poor detergents. However, certain mixtures of alkaline and surface active materials showed poor washing performance even though they were found to have physical and chemical characteristics resembling those of excellent detergents. In view of the interest in surface active materials and detergent-sanitizers and the paucity of reliable information that would indicate what might be expected of them for dishwashing, a performance test study was made using a technique that has been described in earlier papers. A study was also made on the effect of the quaternary ammonium compounds on the washing performance of alkaline detergents by this procedure. (Author)

PB-215 058
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
SEDIMENT PRODUCTION RATING, WILLAMETTE BASIN, OREGON.
1 Jan 62, 11p Working Paper-10
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Umpqua River Basin, *Sediment transport), (*Willamette River Basin, *Water pollution), (*Oregon, Water pollution).

Based on the experience gained in rating the Umpqua Basin streams, the work of determining the sediment load of rivers was extended north into the adjacent Willamette Basin Oregon, on areas of similar geology, climate, cover, and land use. Here there is less available information from sediment sampling, and the rating estimates are necessarily subjective.

PB-215 059
Environmental Health Center, Cincinnati, Ohio.
TENTATIVE ANALYTICAL METHODS FOR CADMIUM, CHROMIUM, AND CYANIDE IN WATER,
C. C. Ruchhoft, W. A. Moore, G. E. Terhoeven, F. M. Middleton, and H. L. Krieger. 1 Dec 49, 21p

Descriptors: (*Water analysis, *Water pollution), (*Cadmium, Water analysis), (*Chromium, Water analysis), (*Cyanides, Water analysis), Ohio River, Potable water, Chemical analysis.
Identifiers: *Water pollution detection.

Contents:
- Collection, preservation, and preparation of samples;
- Qualitative procedure;
- Quantitative procedure;
- Pyridine-benzidine method;
- Modified liebig method;
- Modified liebig method using an internal indicator;
- Prussian blue method;
- Literature on cyanide determination.

PB-215 060
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
PRELIMINARY REPORT ON THE ADEQUACY OF WATER IN THE YAKIMA RIVER BASIN, WASHINGTON,
Donald P. Dubois. Aug 63, 75p Working Paper-44
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Yakima River basin, *Water pollution), (*Columbia River basin, Water pollution), (*Washington (State), Water pollution).
Identifiers: *Water quality data.

The report describes the adequacy and quality of ground and surface waters in the Yakima river basin in Washington State.

PB-215 079
Public Health Service, Portland, Oreg.
SOUTH YAMHILL RIVER BASIN PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.

23 Feb 62, 8p Working Paper-14

Descriptors: (*Economic development, *Yamhill River Basin), (*Oregon, Economic development), River basin development.
Identifiers: *Polk County (Oregon).

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the South Yamhill River Basin which includes the southern half of Yamhill County and the northern third of Polk County, in Oregon.

PB-215 080
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
STABILIZATION PONDS FOR TREATMENT OF INDUSTRIAL WASTES. INVENTORY AND REFERENCE MATERIAL,
Ralph Porges, G. L. Harlow, E. J. Struzeski, and Grover L. Morris. 1961, 36p SEC-TR-W61-29

Descriptors: (*Industrial waste treatment, Lagoons (Ponds)), (*Reviews, *Lagoons (Ponds)), Bibliographies, Inventories.
Identifiers: *Water pollution control.

Acceptable methods for utilizing stabilization ponds, for treatment and disposal of industrial wastes, are reported. An extentive bibliography is included.

PB-215 081
Federal Water Pollution Control, Administration, Annapolis, Md. Chesapeake Field Station.
THE ROLE OF MATHEMATICAL MODELS IN THE POTOMAC RIVER BASIN WATER QUALITY MANAGEMENT PROGRAM.

Dec 67, 14p
Presented at an Interdepartmental Conference Convened at the Request of Assistant Secretary, Kenneth Holum, 13 Dec 67.

Descriptors: (*Potomac River, *Water pollution), Mathematical models.

Water quality investigations in the Potomac River Basin have been conducted for the past several years by the Chesapeake Field Station as part of the Chesapeake Bay-Susquehanna River Basins Project. As an integral part of the project, large mathematical simulation models were developed. The models, after verification, are being applied to this river basin as well as others in the Chesapeake Bay drainage system. The general relationship of these models to management of Potomac water quality is shown. (Author)

PB-215 082
Newark Coll. of Engineering, N. J. Dept. of Civil Engineering.
EQUALIZATION OF LIQUID WASTES.
Final progress rept.,
Ivan Metzger. 1965, 49p
PHS-WP-41

Descriptors: (*Sewage treatment, *Flow control).
Identifiers: *Sewage flow rate.

The operation of waste treatment plants is often complicated by an intermittent flow of toxic materials, known as shock loads, usually from industrial sources. These shock loads, containing high concentrations of pollutants, may upset biological activity, fail to be adequately treated, or disrupt treatment programs. Intermittent dischages may cause such wide fluctuations in concentrations at the plant that adequate treatment may not be obtained. The solution usually involves some type of holding tank,in which an attempt is made to reduce the extremes of concentration. The report describes an ideal equalization tank defined as one which would, following a shock load, produce a uniform effluent concentration. Since the mean of the effluent tracer pattern represents the theoretical detection time, the effluent pattern sought is horizontal for twice the theoretical detention time. It is shown that a triangular shape of constant depth with continuous discharge would produce ideal equalization. (Author)

PB-215 083
Environmental Health Center, Cincinnati, Ohio.
ANNUAL REVIEW OF LITERATURE (1952) ON ANALYTICAL METHODS PERTAINING TO SEWAGE AND INDUSTRIAL WASTES ANALYSIS,
William Allan Moore. Feb 53, 23p

Descriptors: (*Water analysis, Reviews).
Identifiers: *Water pollution detection.

The report reviews methods used to analysis water for the following: Biochemical oxygen demand; Oxygen consumed; Dissolved oxygen; Kjeldahl nitrogen; Ammonia nitrogen; Nitrate nitrogen; Organic compounds; Color and turbidity; Metallic ions; Hardness; Halogens; Cyanogen compounds; Sulfur compounds; and Detergents.

PB-215 084
Federal Water Pollution Control Administration, Edison, N.J. Northeast Region Research and Development Program.
USE OF CHEMICALS TO TREAT OIL ON WATER.
Status rept.

20 Feb 69, 21p

Descriptors: (*Water pollution, *Oils), (*Dispersants, Oils), (*Absorbers (Materials), Oils), (*Gelling agents, Oils).
Identifiers: *Oil pollution removal, *Sinking agents.

The report discusses the use of chemical compounds to assist in the control of oil on the water and subsequent clean-up operation. Basically, chemicals are employed to disperse, gel, sink, absorb, and facilitate the burning of oil. The basis of present knowledge has resulted primarily from experience with the major spills involving the tankers TORREY CANYON and OCEAN EAGLE and the offshore oil platform at Santa Barbara, California. (Author)

PB-215 085
Environmental Health Center, Cincinnati, Ohio.
THE BACKGROUND RADIOACTIVITY OF WATER AND BIOTA OF THE SAVANNAH RIVER (1951-1952),
C. C. Ruchhoft, L. R. Setter, A. S. Goldin, and R. J. Velten. Nov 52, 17p

Descriptors: (*Savannah River, *Radioactivity), (*Environmental surveys, Radioactivity), (*Water pollution, *Radioactive contaminants), Aquatic animals, Assaying, Georgia.

In the Environmental Health Center survey of the Savannah River in 1951-1952, 32 water, 282 fresh water biota, and 438 estuarine biota samples were collected and shipped to Cincinnati for the assay of gross alpha and beta radioactivity. Radioactive assays were made on the diasolved and suspended solids of water samples and the flesh and bony tissues of the biological samples. (Author)

PB-215 086
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
GREAT LAKES-ILLINOIS RIVER BASINS COMPREHENSIVE STUDY. APPENDIX V . BIOLOGICAL INVESTIGATIONS OF THE UPPER ILLINOIS WATERWAY.
Aug 61, 24p

Descriptors: (*Illinois Waterway, *Water pollution), (*Illinois, Water pollution), Indicator species, Worms, Invertebrates, Water quality, Phytoplankton.

The analyses of data that were collected during the biological survey of the Upper Illinois Waterway indicated that definite degradation by man-contributed pollution had defiled the canalized waterway in the reaches studied; bottom animals especially are expressive of degradation. The bottom animals show responses to both domestic sewage and wastes of industrial origin as degradation agents.

PB-215 087
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Community Air Pollution Program.
'UNIVERSAL' AIR POLLUTANT ANALYZER,
D. F. Adams, H. J. Dana, and R. K. Koppe. 4 Sep 57, 41p
Prepared in cooperation with Washington State Inst. of Tech., Pullman.

Descriptors: (*Air pollution, *Monitors), (*Hydrogen fluoride, *Gas analysis), (*Sulfur dioxide, *Gas analysis).
Identifiers: *Air pollution sampling, *Air pollution detection.

Two prototype automatic atmospheric pollutant analyzers suitable for producing dosimeter or continuously integrated records have been designed and constructed. The Zirconium-Eriochrome Cyanine R reagent for fluoride and the Starch-Iodine Blue reagent for sulfur dioxide have been modified for use in the analyzers. The reduced stability of these reagents under continuous air aeration for periods exceeding 4-12 hours limits the pollutant concentration which may be accumulated by a single reagent charge. This appears, however, to be desirable from the viewpoint of field application. Simultaneous comparisons were made between the Thomas Autometer, Titrilog and the Dosimeter for sulfur dioxide and an automatic scrubbing soulution collector and the Dosimeter for hydrogen fluoride.

PB-215 088
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
VERTICAL TEMPERATURE DIFFERENCE OBSERVED OVER AN URBAN AREA,
Gerard A. DEMarrais. 1960, 16p

Descriptors: (*Urban areas, *Temperature inversions), (*Air pollution, Temperature inversions), Rural areas.
Identifiers: *Louisville (Kentucky).

Temperature differences recorded from thermohms at the 60, 170, and 524-foot levels on the WHAS-TV tower in Louisville are analyzed. The data indicate that the heat island of an urban area has a considerable effect on the vertical temperature differences observed at night so that the normal diurnal range of stability conditions encountered over an urban area is much smaller than that over open country. (Author)

PB-215 089
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Community Air Pollution Program.
FIELD EVALUATION OF AN IMPROVED SMOKE INSPECTION GUIDE,
Andrew H. Rose, Jr., and John S. Nadar. 1965, 8p

Descriptors: (*Air pollution, Smoke), (*Smoke, *Densitometers).
Identifiers: *Air pollution detection.

A field evaluation of a prototype PHS Smoke Inspection Guide was conducted. It was concluded that this type of guide was more reproducible and more adaptable for field use than the printed Ringelmann Chart. Empirical calibrations of the prototype guide were made initially and after little, moderate, and heavy field use. The usability of the guide in field application was evaluated on the basis of interferences, ease of application and maintenance. In all cases the responses indicated little or no undesirable effects.

PB-215 090
Environmental Health Center, Cincinnati, Ohio.
PROGRESS REPORT OF TASTE AND ODOR STUDY BEING CONDUCTED AT THE ENVIRONMENTAL HEALTH CENTER, CINCINNATI, OHIO,
Harry Braus, Graham Walton, and F. M. Middleton. 1965, 4p

Descriptors: (*Water pollution, Taste), (*Water supply, *Taste), (*Odors, Water supply), (*Ohio River, Water pollution).

Extensive abnormal tastes and odors have occurred during the past several years in many public water supplies using the Ohio River and its tributaries as sources of water. A visit to a number of the water plants from Pittsburgh to Cincinnati in December 1948 confirmed that most water plants in this section experienced pronounced taste and odor problems in October and November of 1948. The periodic recurrence of objectionable tastes and odors in these waters has caused much concern to consumers and to water works and health officials. Early in 1949 a study of this problem was instituted by the staff of the Environmental Health Center at Cincinnati, Ohio. This progress report is presented as a matter of information concerning the findings of the study to September 1949 which may be of interest to those concerned with taste and odor problems.

PB-215 091
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
SEWAGE STABILIZATION POND DESIGN FACTORS.
1 Jul 57, 5p

Descriptors: (*Sewage treatment, Lagoons (Ponds)), (*Lagoons (Ponds), Design criteria).

The report describes criteria pertinent to effective design of sewage stabilization ponds. Considerations such as site selection, construction methods, sewage capacity, and pond maintenance are discussed.

PB-215 092
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SPECIAL STUDY OF SEWAGE TREATMENT FACILITIES AT MAMMOTH CAVE NATIONAL PARK, KENTUCKY.
Jul 56, 23p
Prepared in cooperation with Public Health Service, Charlottesville, Va. Region III Office.

Descriptors: (*Sewage treatment, *National parks), Kentucky.
Identifiers: *Mammoth Cave National Park.

The report describes a special study of the sewage treatment facilities serving Mammoth Cave National Park. The objectives of this study were to determine, the quantity and characteristics of the sewage produced in this heavily used National Park and, the efficiency of the units of the sewage treatment plant. (Author)

PB-215 093
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Community Air Pollution Program.
AIR POLLUTION EFFECTS OF INCINERATOR FIRING PRACTICES AND COMBUSTION AIR DISTRIBUTION,
Andrew H. Rose, Jr., Robert L. Stenburg, Morton Corn, Ronald R. Horsley, and Daniel R. Allen.
1965, 40p

Descriptors: (*Incinerators, Design criteria), (*Air pollution, *Combustion products), (*Waste disposal, Incinerators).
Identifiers: *Air pollution abatement, *Solid waste disposal.

A study is under way to determine the relationships between incinerator design criteria and resulting atmospheric contaminant discharges. Tests are made by burning a fuel of constant composition in a prototype multiple chamber incinerator under controlled conditions. Effects of variables are measured by analyzing the flue gases for solids, hydrocarbons, oxides of nitrogen and carbon monoxide. The series of tests herein reported was made to (1) provide information on the relative importance of such variables as stoking and amount of fuel per charge insofar as they affect the production of atmospheric pollutants, and (2) evaluate the chosen levels of variables such as excess combustion air, underfire and secondary air distribution, and fuel charging rate.

PB-215 094
Environmental Health Center, Cincinnati, Ohio.
PROCEDURE FOR THE DETERMINATION OF ODOR ON OHIO RIVER STUDY.

Jul 50, 6p

Descriptors: (*Water analysis, *Odors), (*Ohio River, Odors).
Identifiers: *Water pollution detection.

The report establishes a standard procedure whereby unbiased odor determination of river water may be made in laboratories.

PB-215 095
Pacific Northwest Water Lab., Corvallis, Oreg.
PLYWOOD PLANT GLUE WASTES DISPOSAL.
Final rept.,
Danforth G. Bodien. Jan 69, 90p FR-5
See also PB-215 128.

Descriptors: (*Plywood, Industrial wastes), (*Glue, *Industrial waste treatment), (*Water pollution, Glue), (*Industrial wastes, Glue), Phenol formaldehyde resins, Urea formaldehyde resins.
Identifiers: *Wood processing industry, *Water pollution control.

The cleanup of glue spreaders at plywood mills produces a waste that is high in pollutional strength, though quite low in volume. The plywood industry uses three basic types of glue: the blood-soya, or protein variety, for interior grade plywood; the phenolic formaldehyde variety used primarily for exterior grade plywood; and a urea formaldehyde glue used for hardwood paneling. The study was carried out to determine the magnitude and extent of the problem created by the disposal of glue wastes, review the characteristics of plywood glue wastes, and recommend methods of treatment for these wastes. The study area includes the States of Oregon, Washington, Montana, Idaho, and California.

PB-215 096
Rutgers - The State Univ., New Brunswick, N.J. Dept. of Environmental Science.
FACTORS INFLUENCING THE CONDENSATION OF 4-AMINOANTIPYRINE WITH PHENOLS,
Samuel D. Faust, and Frederick C. Lorentz. 1964. 27p
Presented at Ontario Industrial Waste Conference (11th), Bigwin Inn, Ontario, 21-24 Jun 64.

Descriptors: (*Phenols, Chemical analysis), (*Colorimetric analysis, Phenols), (*Water analysis, Phenols).
Identifiers: *Antipyrine/amino, *Water pollution detection.

Phenolic compounds condense with 4-Aminoantipyrine and by subsequent oxidation under alkaline conditions produces a color the intensity of which is proportional to the phenol concentration. These condensation and oxidation reactions have been applied to the detection and determination of phenols in water and waste waters. The report discusses the physical and chemical factors influencing these reactions from a critical review of the literature and from independent research. (Author)

PB-215 097
Public Health Service, New York. North Atlantic Drainage Basins Office.
POTOMAC RIVER BASIN. REPORT ON WATER POLLUTION CONTROL.
Water pollution series.

1951, 101P PHS-Pub-138, PHS-WPS-28

Descriptors: (*Potomac River basin, *Water pollution).

The report presents a reasonably adequate picture of the (July 1950) status of water pollution in the Potomac River Basin, and is a step in the furtherance of comprehensive programs for water pollution control in the Basin. (Author)

PB-215 098
Robert S. Kerr Water Research Center, Ada, Okla.
FATE OF DDT AND NITRATE IN GROUND WATER,
Marion R. Scalf, Victor L. Hauser, Leslie G. McMillion, William J. Dunlap, and Jack W. Keeley. Apr 68, 86p
Prepared in cooperation with Southwestern Great Plains Research Center, Bushland, Tex.

Descriptors: (*Ogallala aquifer, *Water pollution), (*Aquifers, Water pollution), (*Ground water, Water pollution), (*DDT, Water pollution), (*Nitrates, Water pollution), New Mexico, Texas, Water supply, Ground water recharge.
Identifiers: *Path of pollutants.

Increasing demands on the water resources of the High Plains area of West Texas and Eastern New Mexico have given rise to possibility of storing water underground. This would be accomplished by recharging the Ogallala Aquifer. Artificial recharge practices give rise to concern that ground water may be contaminated by pesticides and nitrates introduced with the recharge water. The report presents findings concerned with the fate of DDT and nitrate under actual recharge conditions in the Ogallala Aquifer.

PB-215 099
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BIBLIOGRAPHY ON SYNTHETIC DETERGENTS IN WATER AND WASTES, INCLUDING ANALYTICAL METHODS AND PHYSIOLOGICAL EFFECTS.

Jun 64, 93p

Descriptors: (*Water treatment, Detergents), (*Sewage treatment, Detergents), (*Water pollution, *Detergents), Bibliographies, Physiology, Animals, Humans, Ecology.

A bibliography has been prepared on the problems caused by synthetic detergents in water and waste treatment plants and in surface and underground waters as well as on analytical methods for synthetic detergent components and the physiologic effects of such materials. It contains references to most of the published literature in this field through June 1964. Those articles which have been abstracted in Water Pollution Abstracts or in Chemical Abstracts include the reference to these journals following the source reference.

PB-215 100
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
THE DETERMINATION OF DISSOLVED OXYGEN BY THE RIDEAL STEWART AND ALSTERBERG MODIFICATIONS OF THE WINKLER METHOD,
C. C. Ruchhoft, W. Allan Moore, and O. R. Placak. 1965, 11p

Descriptors: (*Water pollution, Water analysis), (*Water analysis, *Dissolved gases), (*Oxygen, Water analysis).
Identifiers: *Water pollution detection, *Winkler analysis.

Among the many modifications of the Winkler method advocated for the determination of dissolved oxygen in the presence of nitrite, probably the most widely used is the Rideal-Stewart method. It has been recognized for some time,

however, that in the presence of organic matter this modification gives low results. Noll proposed the use of urea for the destruction of nitrites but its use requires a long period of contact (approximately twenty-four hours) and is, therefore, impracticable. Alsterberg substituted sodium azide for urea and found that the destruction of nitrite could be accomplished in a few minutes. The report presents a comparative study of the sodium azide and Rideal Stewart modifications during the course of a survey of the Scioto River.

PB-215 101
American Society of Civil Engineers, New York.
MUNICIPAL INCINERATOR DESIGN. A SURVEY OF ENGINEERING PRACTICE.

1965, 28p
Sponsored in part by Public Health Service, Washington, D.C.

Descriptors: (*Incinerators, Design), (*Waste disposal, Incinerators).
Identifiers: *Solid waste disposal, *Air pollution abatement.

Sanitary solid waste disposal is basic to community sanitation. Incineration is a method of solid waste disposal which is particularly applicable to cities and metropolitan areas where available land for sanitary landfilling is depleted or not available. With the trend toward expanding urban areas and metropolitan complexes, incineration may well play an increasingly important part in solving community solid waste disposal problems. Thus this study was undertaken to collect data on current engineering practice in this field to permit better evaluation of engineering and related needs.

PB-215 102
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
STREAM POLLUTION AND ITS CONSEQUENCES,
J. K. Hoskins. 1938, 15p

Descriptors: (*Water pollution, Reviews).

The report defines types of pollutants found in water supplies, identifies sources of pollution, and offers remedial action courses to alleviate the consequences of stream pollution.

PB-215 103
Field Information Agency, Technical.
MATERIALS, TECHNIQUES, AND TESTING METHODS FOR THE SANITATION (BACTERIAL DECONTAMINATION) OF SMALL-SCALE WATER SUPPLIES IN THE FIELD USED IN GERMANY DURING AND AFTER THE WAR.
Final rept.,
Alexander Goetz. 8 Dec 47, 10p FIAT-1313

Descriptors: (*Sewage treatment, *Military operations).

The report presents results obtained from investigations of the nature and methods for water purification used in Germany during and following the second world war.

PB-215 104
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
MAD RIVER BASIN CALIFORNIA. BUTLER VALLEY PROJECT. WATER SUPPLY AND WATER QUALITY CONTROL STUDY.
May 67, 45p
Sponsored in part by Corp of Engineers, San Francisco, Calif.

Descriptors: (*Mad River basin, *Water pollution), (*Water supply, Mad River basin), (*California, Water supply).
Identifiers: *Humbolt County (California), *Trinity County (California).

A study was made which discloses that municipal and industrial water supply needs in the Mad River Basin, the Eureka Plain and the adjacent communities will increase from 81,000 acre-feet in 1970 to 244,000 acre-feet/year by 2070. The benefits of providing for water needs above the capacity of existing water supplies total $18,000,000 and have a present annual equivalent value of $680,000 per year including operation and maintenance costs. Minimum stream flows required for the existing fishery will be adequate to maintain water quality in the Mad River and therefore, storage in the proposed reservoir for stream flow regulation for water quality control is not required. (Author)

PB-215 105
Minnesota Univ., Minneapolis. Sanitary Engineering Div.
FACTORS AFFECTING THICKENING IN LIQUID SOLIDS SEPARATION.
Final rept., 1 Oct 60-31 Mar 64,
George J. Schroepfer, and N. R. Ziemke. 31 Mar 64, 128p Sanitary Engineering-158-S
Contract PHS-WP-205

Descriptors: (*Sewage treatment, *Settling), (*Sedimentation, Sewage treatment), (*Sludge disposal, *Thickening).
Identifiers: *Sludge treatment.

The general objective of the research program was to investigate the factors affecting the thickening of various types of liquid-solids suspensions by gravity sedimentation of interest in sewage treatment. The more specific aims of the program were as follows: to study the fundamental concepts and mechanisms involved in the gravity thickening process on both a batch and continuous flow basis; to determine the significant loading parameters which affect the performance of the continuous flow thickening process and attempt to numerically evaluate the relationship between loading and performance of the process as applied to various solids suspensions and sludges; to determine if the results of batch thickening tests on a particular solids suspension can be used to predict the limiting load and design capacity of a plant scale continuous flow thickener; and to develop a rational method for the design and operation of full scale thickeners. (Author)

PB-215 106
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
INDUSTRIAL WASTES PROBLEMS WITH REFERENCE TO SEWAGE TREATMENT,
Hayse H. Black. 1958, 11p
Presented at the Annual Short Course for Water and Sewage Plant Operators (26th), University of Florida, Gainesville. 5 June, 1958.

Descriptors: (*Sewage treatment, Reviews), (*Industrial wastes, Sewage treatment).

The report describes methods for treatment of domestic and industrial wastes prior to discharge into running waters.

PB-215 107
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
COORDINATED CLEAN-UP,
M. B. Ettinger. 1960, 12p
Presented at the Nebraska Sewage and Industrial Wastes Association, Omaha, Nebraska, 4 November, 1960.

Descriptors: (*Water supply, *Water quality), (*Water pollution, Trends).
Identifiers: *Water pollution abatement.

The report is a discussion of the salient features desired for maintaining an acceptable qualitative and quantitative water supply in light of an expanding population.

PB-215 108
Environmental Health Center, Cincinnati, Ohio.
INDUSTRIAL WASTE SURVEY REPORT.

May 53, 9p
Prepared in cooperation with Darling and Co., Melvindale, Mich.

Descriptors: (*Rouge River, *Water pollution), (*Michigan, Water pollution).
Identifiers: Sewage treatment effluent, *Wayne County (Michigan).

A survey was conducted to determine the characteristics of the process wastes discharged from the Wayne County Sewage Treatment Plant at Wyandotte, Michigan to Rouge River.

PB-215 109
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE USE OF THE GAMMA SPECTROMETER FOR THE IDENTIFICATION OF RADIONUCLIDES IN WATER,
G. Richard Hagee, Abraham S. Goldin, and Conrad P. Straub. 19 Dec 57, 17p
Revision of report dated 29 Nov 57.

Descriptors: (*Water analysis, *Radioactive contaminants), (*Gamma spectroscopy, Water analysis).

The availability of commercial gamma spectrometers has greatly simplified the problem of identification of radionuclides. Experience with this equipment for such identification in rain, cistern, and surface waters is described. Data are presented showing differences obtained as a function of water fraction, age of samples, etc. Information on the applicability of this technique to quantitative determinations of specific radionuclides is also included. (Author)

PB-215 110
Sanitary Engineering Center, Cincinnati, Ohio.
THE VALUE OF INDIVIDUAL FACILITIES,
James B. Coulter. 1957, 14p
Presented to the 'Work-Shop - Fringe Area Sanitation', The American Society of Civil Engineers, Jackson, Mississippi, 17-18 February 1957.

Descriptors: (*Septic tanks, *Land development).

The report describes the impact of 'population explosion' on the demand for increased housing and, of necessity, the increased need for substitutes for municipal sewage treatment facilities. Site selection has necessitated the septic tank system and the report delineates the conditions that must be met to insure satisfactory performance of such a system.

PB-215 111
Environmental Health Center, Cincinnati, Ohio.
INDUSTRIAL WASTE SURVEY REPORT, MAY 20 TO MAY 27, 1953.
1953, 22p
Prepared in cooperation with Port Huron Sulphite and Paper Co., Port Huron, Michigan.

Descriptors: (*Paper industry, Water pollution), (*Water pollution, Industrial wastes), (*Industrial wastes, Paper industry), (*Black River, Water pollution), (*Michigan, Water pollution).
Identifiers: *Water quality data.

The survey was conducted to determine the characteristics of the process wastes and the residual pollution load discharged to the Black River by the Port Huron Sulfite and Paper Co. This project was part of the continuing study of boundary waters pollution being conducted for the International Joint Commission. This plant is located on the north bank of the Black River near the western edge of the city of Port Huron.

PB-215 112
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT ON SCIOTO RIVER STUDIES WINTER PERIOD, JANUARY 1954-FEBRUARY, 1954.

1954, 44p

Descriptors: (*Scioto River basin, *Water pollution), (*Ohio, Water pollution).
Identifiers: *Water quality data.

Data regarding significant sources of pollution and existing water supplies in the Scioto River basin in Ohio have been listed. Samples from seven stations on the Scioto River including the water intake site were collected for seven consecutive days and analyzed for the common parameters of pollution. Determinations were made on some of these samples to determine the quantities of fluoride and detergents present. Additional samples were collected from various points on the Scioto River and from several tributaries to obtain further information regarding the effects of industrial wastes and synthetic detergents on water quality. Special samples were collected for spectrographic, organic, and mineral analysis.

PB-215 113
Public Health Service, Washington, D.C. Div. of Air Pollution.
INCINERATORS: SELECTED PROVISIONS INCORPORATED IN AIR POLLUTION ORDINANCES.

Jul 61, 27p

Descriptors: (*Air pollution, *Regulations), (*Incinerators, air pollution), Combustion products.
Identifiers: Air pollution abatement.

The report describes selected provisions relating to incinerators and air pollution for Chicago, St. Louis, Philadelphia, Allegheny County, New York State, Los Angeles County, Washington, D.C., and San Francisco.

PB-215 114
Public Health Service, Washington, D.C.
REPORT FOR CONSULTATION ON THE HAWAIIAN ISLANDS INTRASTATE AIR QUALITY CONTROL REGION (HAWAII).

1970, 46p APTD-1203

Descriptors: (*Hawaii, *Air pollution).
Identifiers: *Air quality data.

To implement a successful air resource management program, an air quality control region should be large enough to encompass most air pollution sources as well as most people and property affected by those sources. The boundaries should also include those locations where present development creates, or where projected urbanization and industrialization will create, significant air pollution problems. Finally, the region should be compatible with or hopefully even foster unified and cooperative governmental administration of the air resource. The proposed Hawaiian Islands Intrastate Air Quality Control Region was designed to satisfy, in the best way, these requirements.

PB-215 115
Environmental Health Center, Cincinnati, Ohio.
TREATMENT AND DISPOSAL OF ATOMIC ENERGY WASTE CONTAINING RADIOACTIVE ISOTOPES,
C. C. Ruchhoft, Arthur E. Gorman, and C. W. Christenson. 7 Sep 51, 19p
Presented at the Symposium on Liquid Industrial Wastes, American Chemical Society Diamond Jubilee Meeting, New York. 7 Sep 1951.

Descriptors: (*Radioactive waste processing, *Reviews).
In sharp contrast with wastes of other industries, radioactive wastes may not be objectionable as measured by such common characteristics as odors, tastes and biochemical oxygen demand, yet they may be most dangerous because of levels of radioactive energy and long periods of activity. Furthermore, their cumulative effects on living organisms are not too well understood. The intricate and carefully controlled processing of radioisotopes and their manyfold uses in production and research ultimately lead to radioactive wastes in solid, liquid and gaseous forms; and treatment of a waste for decontamination in one form may result in radioactive wastes in another. The report discusses the treatment and disposal of these wastes.

PB-215 116
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN CHEYENNE INTRASTATE AIR QUALITY CONTROL REGION.
Aug 70, 54p APTD-1200

Descriptors: (*Wyoming, *Air pollution).
Identifiers: *Cheyenne (Wyoming), *Air quality data.

To implement a successful air resource management program, an air quality control region should be large enough to encompass most air pollution sources as well as most people and property affected by those sources. The boundaries should also include those locations where present development creates, or where projected urbanization and industrialization will create, significant air pollution problems. Finally, the region should be compatible with or hopefully even foster unified and cooperative governmental administration of the air resource. The proposed Metropolitan Cheyenne, Wyoming, Intrastate Air Quality Control Region was designed to satisfy, in the best way, these requirements.

PB-215 117
Robert S. Kerr Water Research Center, Ada, Okla. Treatment and Control Research Program.
THE IMPACT OF AGRICULTURAL POLLUTANTS--ON SUBSEQUENT USERS,
James P. Law, Jr., and Harold Bernard. Jun 69, 20p
Presented at the 1969 American Society of Agricultural Engineers Annual Meeting, Purdue Univ., Lafayette, Ind. 22-25 Jun 69 (Paper no. 69-235).

Descriptors: (*Agricultural wastes, *Water pollution), (*Irrigation, Water pollution), (*Fertilizing, Water pollution).

Pollutants arising from agricultural activities can have adverse and detrimental effects on the water quality requirements of subsequent users. The major sources and types of pollutants involved are discussed. Their effect and impact on subsequent users are considered. The need for improved management and/or treatment concepts to minimize the effects of the pollutants discharged to receiving waters is discussed. Suggestions are offered regarding agriculture's responsibility in water pollution control activities. (Author)

PB-215 118
Robert S. Kerr Water Research Center, Ada, Okla.
EUFAULA RESERVOIR AERATION RESEARCH - 1968,
Lowell E. Leach. 1968, 13p

Descriptors: (*Reservoirs, *Aeration), (*Eufaula Reservoir, Aeration), (*Stratification, Reservoirs), Oklahoma, Limnology.

Aeration research conducted in 1968 at Eufaula Reservoir is described and is a continuation of a 1967 study of the dynamics of reservoir destratification conducted by personnel of the Robert S. Kerr Water Research Center, Federal Water Pollution Control Administration, Aka, Oklahoma. The research and aeration system was modified as a result of the findings of the 1967 pilot study.

PB-215 119
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE USE OF VEGETABLE CULTURES AS THE PHOTOSYNTHETIC COMPONENT OF ISOLATED ECOLOGICAL CYCLES FOR SPACE TRAVEL,
Linvil G. Rich, William Marcus Ingram, and Bernard B. Berger. Jan 60, 19p
Presented at National Annual Meeting, American Astronautical Society (6th), New York City, N. Y., 18-21 Jan 60. (Preprint No. 60-25).

Descriptors: (*Photosynthesis, *Closed ecological systems), (*Space flight, *Food supply), (*Bioastronautics, Photosynthesis), Human ecology, Survival in space, Plants (Botany), Food, Cycles, Energy, Algae.

Although dehydrated foods and tanked water and oxygen will suffice for space flights of relatively short duration, long-term operations will be possible only if these necessities can be derived from the environment within the space vehicle. Conservation of environmental mass will make mandatory some type of closed ecological system kept in operation by a source of continuous energy. Conceivably, such a system will involve a carbon-dioxide exchange between humans and plants, waste reutilization, and the growth of plants for human consumption. Several sustenance systems have been proposed. In each case, attention was centered on the use of algae as the photosynthetic component of the closed cycle. Algae has been used as a dietary supplement, but no instance has been reported where the diet of man, or any other terrestrial mammal, has consisted entirely of algae. In contrast, higher plants have long been a primary source of human food material. Thus the study reports the use of higher plants as the photosynthate in the human sustenance system.

PB-215 120
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
EPIDEMIOLOGICAL STUDIES,
Ralph E. Wheeler, William E. Burns, and Frank P. McEnteer. 1942, 99p
Supplement E to Final Report to the Ohio River Committee, Ohio River Pollution Survey.

Descriptors: (*Water pollution, *Infectious diseases), (*Bacterial diseases, Water pollution), (*Epidemiology, Bacterial diseases), Water supply, Contamination, Bacteria, Public health, Ohio, Rivers, Watersheds.

Field studies of water-borne disease on the Ohio River watershed were made during the Ohio River Pollution Survey, 1939-1940. These studies covered field epidemiological investigation of outbreaks of apparently waterborne disease; field bacteriological studies of these outbreaks; laboratory experimental studies, not definitely connected with outbreaks of disease, and statistical study of mortality from diarrheal and enteric diseases throughout the watershed. (Author)

PB-215 121
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RADIOCHEMICAL ANALYSES FOR PREOPERATIONAL SURVEILLANCE,
A. S. Goldin, and Conrad P. Straub. 1958, 11p
Presented at the Annual Conference on Analytical Chemistry in Reactor Technology (2nd) Held in Gatlinburg, Tenn., 1 Oct 58.

Descriptors: (*Radioactivity, Sampling).
Identifiers: *Baseline measurement.

In the present state of the art in nuclear operations, environmental monitoring is as fundamental as film badges, neutrons, or uranium. Presumably there will come a time when one is sufficiently confident of the ability to design a reactor, a chemical processing plant, or other nuclear facility, that the question of environmental contamination will never arise; that time has not yet come. Preoperational monitoring to date has chiefly consisted of measurements of gross activity; it is the purpose of the paper to show the usefulness of analysis for specific nuclides in this type of measurement. (Author)

PB-215 122
Public Health Service, Cincinnati, Ohio. Div. of Sanitary Engineering.
A STUDY OF THE OPERATION OF THE MECHANICAL ACTIVATED SLUDGE PLANT AT THE ERIE PROVING GROUNDS, LACARNE, OHIO,
W. A. Moore, R. S. Smith, and C. C. Ruchhoft.
Feb 46, 10p

Descriptors: (*Sewage treatment, *Activated sludge process), Military facilities, Ohio.
Identifiers: *Sewage treatment plants, Lacarne (Ohio), Erie proving grounds.

The report provides a description of a small activated sludge sewage treatment plant and presents engineering data derived from observations.

PB-215 123
Public Health Service, Cincinnati, Ohio. Water and Sanitation Investigations.
A LABORATORY STUDY OF THE TREATMENT OF ALPHA TNT WASTES WITH IRON FILINGS,
F. Y. Norris, C. C. Ruchoft, and S. Megregian. 11 Mar 46, 9p

Descriptors: (*Trinitrotoluene, *Industrial waste treatment), (*Nitro compounds, Industrial waste treatment), Explosive materials, Iron.
Identifiers: *Water pollution control.

Experiments were performed to determime the practicability of removing alpha TNT from water by using iron filings. In preliminary experiments, it was observed that alpha TNT was completely removed from solution by a one inch diameter filter with a twelve inch depth of iron filings. Quantitative experiments indicated that an average dose of 320 ml. per day of waste can be treated by 398 g. of iron filings for 65 days before the filtrate shows the presence of TNT, and a total of 5.453 g. of TNT can be removed before it becomes necessary to replace the iron. Short time filterations will remove about nine times the average daily rate indicated. (Author)

PB-215 124
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RESEARCH IN THE RADIOACTIVE CONTAMINATION OF THE ENVIRONMENT,
Conrad P. Straub. 1959, 27p

Descriptors: (*Radioactive contaminants, *Environmental surveys), Fallout.

In the paper, the studies under way at the Robert A. aft Sanitary Engineering Center, Cincinnati, to define the levels of radioactive contamination in environmental samples, are described. Currently, measurements of gross activity are being made along with a few measurements of the more hazardous radionuclides. In addition, some other nuclides are identified. The levels of activity in air (from fallout and natural radioactivity), in rainfall, snow, cistern and surface water, and in milk and other food materials, are indicated. The contribution of these sources to the strontium-90 intake has been estimated and areas in which additional studies must be carried out delineated. (Author)

PB-215 125
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT PREPARATION - WATER POLLUTION SURVEYS,
Ralph Porges. Mar 60, 10p

Descriptors: (*Water pollution, *Technical writing).

The report presents a working outline and format for authors and researchers preparing documents relative to water pollution surveys.

PB-215 126
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
SEDIMENT PRODUCTION RATING, YAKIMA BASIN, WASHINGTON.
Jan 62, 10p Working Paper-11
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Yakima River Basin, *Sediment transport), (*Columbia River Basin, *Water pollution), (*Washington State, Water pollution).

The report describes a survey of the sediment load on the Yakima Basin east of the Cascades in Washington. The several reservoirs in the mountain areas trap much of the sediment coming from lands given a 'high' sediment production rating at the upper elevations. Sediment movement across flat valley lands below 'high' rated slopes and ridges in the lower watershed appears quite limited. Along the middle and lower reaches of the Yakima River, the bulk of the sediment load most probably comes from bankcutting and reworking of channel deposits at times of high flow, and from irrigation return flows during the summer season.

PB-215 127
Environmental Protection Agency, Cincinnati, Ohio. Water Quality Office.
WASTEWATER DENITRIFICATION: COMBINED WITH CARBON ADSORPTION OR CONDUCTED IN SAND MEDIA,
John N. English, Jay B. Pitkin, Charles W. Carry, and Arthur N. Masse. 1970, 42p
Presented at the Annual Water Pollution Control Federation Conference (43rd), Boston, Mass. Oct 1970.

Descriptors: (*Sewage treatment, Nitrogen), (*Chemical removal (Sewage treatment), *Nitrogen), (*Activated carbon treatment, Nitrogen), Nutrients.
Identifiers: *Denitrification, *Tertiary sewage treatment.

The evaluation of columnar denitrification was initiated on a small scale with the intention of applying gained information to additional denitrification studies in the 0.3 mgd (1,140 cu m/day) four-stage carbon tertiary sewage pilot plant. Since denitrification is, by itself, of significant importance, its use is not confined to carbon column operation and would be applicable to column design using media other than carbon to provide surface area. Many applications exist for denitrification that do not require the reduction of dissolved organic material to very low levels. For this reason, a parallel study using 2 in. (5.1 cm) columns was conducted to compare the nitrate removal efficiencies in both granular carbon and sand media. (Author)

PB-215 128
Pacific Northwest Water Lab., Corvallis, Oreg.
PLYWOOD PLANT GLUE WASTES DISPOSAL: PROGRESS REPORT,
Danforth G. Bodien. Feb 68, 56p PR-2
See also PB-215 095.

Descriptors: (*Plywood, Industrial wastes), (*Glue, *Industrial waste treatment), (*Water pollution, Glue), (*Industrial wastes, Glue), Phenol formaldehyde resins, Urea formaldehyde resins.
Identifiers: *Wood processing industry, *Water pollution control.

In the States of Oregon, Washington, Idaho, Montana, and California, 158 plywood plants generate an estimated 6.2 million gallons of waste per day from the cleanup of glue mixing equipment and glue spreaders. The waste is toxic and high in pollutional strength. Treatment of these glue wastes varies from plant to plant but generally consists only of solids separation or the removal of suspended matter. The objective of the study is to determine the magnitude and extent of the problem created by the disposal of glue wastes, review the characteristics of plywood glue wastes, and recommend methods of treatment for these wastes.

PB-215 129
Mississippi State Univ., State College. Dept. of Microbiology.
MECHANISM OF ALGAE-BACTERIA COMPLEXES IN OXIDATION PONDS.
Progress rept., 1 Oct 60-1 Nov 62,
Robert G. Tischer, and Lewis R. Brown. 1 Nov 62, 50p
Grant PHS-WP-193 (C1)

Descriptors: (*Lagoons (Ponds), *Aquatic microbiology), (*Sewage treatment, Lagoons (Ponds)), Thermophiles, Biodeterioration, Bacteria, Algae.
Identifiers: *Aeration ponds.

During the course of the investigation it was found that practically all of the ponds tested contained some thermophilic microorganisms. Studies conducted with these thermophiles indicated that they held considerable potential as a means of stabilizing domestic sewage. It seemed desirable to include in the report only that material relating to sewage stabilization by aerobic thermophiles.

PB-215 130
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN CHICAGO INTERSTATE AIR QUALITY CONTROL REGION (INDIANA--ILLINOIS).

Sep 68, 87p APTD-1217

Descriptors: (*Illinois, *Air pollution), (*Indiana, *Air pollution).
Identifiers: *Chicago (Illinois), *Air quality data.

Air pollution in most of the Nation's urban areas is a regional problem. Consistent with the problem, the solution demands coordinated regional planning and regional effort. The body of this report contains a proposal for the boundaries of the Metropolitan Chicago Interstate Air Quality Control Region and supporting studies on engineering and urban factors. The report itself is intended to serve as the background document for the formal consultation with appropriate State and local authorities.

PB-215 131
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SOME RESULTS OF THE DETROIT-WINDSOR AIR POLLUTION SURVEY,
Morris Katz, and Jean J. Schueneman. 1958, 23p
Prepared in cooperation with the Department of National Health and Welfare, Ottawa (Ontario).

Descriptors: (*Michigan, *Air pollution), (*Canada, Air pollution).
Identifiers: *Detroit (Michigan), *Windsor (Canada), *Air quality data.

The origin of the study, its purposes, and means of accomplishment are described very briefly. The studies conducted and other actions undertaken are outlined. The principal technical findings are

discussed in terms of variation of pollution levels with location in the study area, meteorological parameters and time; estimates of total pollutants discharged to the atmosphere; results of the health study; and observations in the vegetation damage survey. Information is given which will be helpful in the planning and conduct of community air pollution surveys with regard to pollution measurements, pollution emission inventories, and meteorological studies. The voluntary vessel smoke control program and the results of it are described briefly. The current status of the project is mentioned. (Author)

PB-215 132
Public Health Service, San Francisco, Calif. Region IX.
SAN JOAQUIN VALLEY AND SACRAMENTO - SAN JOAQUIN DELTA CALIFORNIA. A PRELIMINARY EVALUATION OF STREAM FLOW REQUIREMENTS FOR WATER QUALITY CONTROL.

Jun 63, 13p
Prepared in cooperation with Bureau of Reclamation, Sacramento, Calif.

Descriptors: (*San Joaquin River, *Water pollution), (*California, Water pollution).

The relatively poor water quality conditions which have prevailed in the lower San Joaquin River and Delta system have resulted in water quality problems to municipal, industrial, agricultural, fishing, and recreational users. Quality objectives and related flow requirements are recommended in the report.

PB-215 133
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
URBAN AIR SAMPLING BY HELICOPTER.
Progress rept.,
R. H. McQuain, J. M. Leavitt, R. C. Wanta, and W. W. Frisbie. 1958, 29p
Prepared in cooperation with the Weather Bureau, Washington, D.C.

Descriptors: (*Helicoptors, *Gas sampling), (*Air pollution, Gas sampling), (*Urban areas, Gas sampling), Temperature measurement.

A method of measuring the concentration of oxidants in the vertical by using a helicopter is described. The helicopter can also be used to obtain the vertical temperature structure over an urban area concurrent with pollution sampling; in addition an estimation of the visible pollutants over a city and surrounding area can be obtained in a minimum of time. (Author)

PB-215 134
Public Health Service, Cincinnati, Ohio. Water and Sanitation Investigations.
A STUDY OF THE DETERMINATION OF PHENOL AND STRUCTURALLY RELATED COMPOUNDS BY THE GIBBS METHOD,
M. B. Ettinger, and C. C. Ruchhoft. Jan 47, 26p

Descriptors: (*Water analysis, *Phenols), (*Water pollution, Water analysis).
Identifiers: *Water pollution detection.

Preliminary to the study of the persistence of phenolic materials in surface water, methods for the determination of phenol and certain closely allied materials have been re-examined. The techniques finally selected differ from those currently used and offer definite advantages where quantitative results are required. Because of these advantages, the modified methods as worked out in this laboratory are presented. The method uses the Gibbs reaction followed by extraction of the color produced with n-butyl alcohol to increase the sensitivity of the reaction.

PB-215 135
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
DOMESTIC WATER USE IN PHOENIX, ARIZONA.
Final rept.,
Gerald M. Sullivan, James B. Coulter, and Thomas W. Bendixen. 15 Jun 59, 23p

Descriptors: (*Arizona, *Water consumption).
Identifiers: *Phoenix (Arizona).

The Federal Housing Administration has in recent years become increasingly aware of the pressing need for improvement in household sewage disposal systems. As a result, a project was undertaken to develop practical design criteria for seepage pits and beds. Careful consideration led to the selection of seven states for study areas, exhibiting wide diversities in such factors as climate, soil types, and construction requirements and practices. Water meter records for individual homes, whenever available, were secured from the water company so that fairly accurate estimates of loading could be established for disposal systems. An analysis of individual water meter records for about 240 homes in Phoenix, Arizona is presented herein, the records being collected in eight subdivisions that range from 2 1/2 years to 5 1/2 years old.

PB-215 136
Federal Water Pollution Control Administration, Metuchen, N.J. Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project.
AN EVALUATION OF THE STREAM POLLUTION CONTROL PROGRAM IN NEW JERSEY.

Oct 66, 93p

Descriptors: (*New Jersey, *Water pollution).
Identifiers: *Water pollution abatement.

Early in 1966, the Governor of New Jersey requested an evaluation of the existing Stream Pollution Control Program in New Jersey with recommendations for improving the effectiveness of the Program. The report evaluates and suggests legislation for revising the state's water pollution control program in response to the Governor's request by the Hudson-Champlain Project of the Federal Water Pollution Control Administration. (Author)

PB-215 137
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigation Station.
THE MICROSCOPIC FLORA AND FAUNA OF TREE HOLES,
James B. Lackery. 1939, 7p

Descriptors: (*Aquatic microorganisms, *Trees), Algae, Phytoplankton, Protozoa, Ecology, Closed ecological systems.
Identifiers: *Tree holes, Tree stumps.

Tree holes that contain water are rare. Occasionally one will be found which is in effect a permanent pool. With reference to their contained water they may be grouped roughly as those in the tops of living stumps, those in crotches or in the tops of protruding limbs or knots, and those in the sides of trees or limbs. Holes so far studied, with few exceptions, have contained rain water, that is, have been free from contamination by surface ground water. This report covers observations on 26 tree holes. About 140 species of algae and protozoa were recovered from these holes and are listed.

PB-215 138
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
OSAGE (MARAIS DES CYGNES) - GASCONADE DRAINAGE BASINS.
Water pollution series.
Mar 52, 55p PHS-WPS-26

Descriptors: (*Osage River Basin, *Water pollution), (*Gasconade River Basin, *Water pollution), (*Missouri, Water pollution), (*Kansas, Water pollution).

The report is based on data available as of March 1, 1952, on sources of pollution, treatment facilities employed, and stream conditions. The report also presents information concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect and those which appear to be needed. Data and knowledge now available are sufficient to permit the immediate solution of most of the pollution problems within the Osage (Marais des Cygnes)-Gasconade River Basins in Kansas and Missouri without awaiting the results of additional surveys and studies.

PB-215 188
Stanford Univ., Calif.
THE ROLE OF SULFIDE IN PREVENTING HEAVY METAL TOXICITY IN ANAEROBIC TREATMENT,
Alonzo William Lawrence, and Perry L. McCarty. 30 Sep 64, 32p

Descriptors: (*Anaerobic processes, Poisons), (*Microorganism control (Sewage), Anaerobic processes), (*Sewage treatment, Anaerobic processes), Inorganic sulfides, Copper, Zinc, Nickel, Iron.

Recently, others have reported that the toxic effects of copper could be eliminated by the addition of sulfide to the digester in stoichiometrically equivalent amounts. It was desired to assess the generality of their report, both with regard to high concentrations of copper and the use of sulfides for control of toxicity of other heavy metals. To this end, the study was performed to evaluate the use and importance of sulfide in the control of toxicity produced by the heavy metals copper, zinc, nickel, and iron in the anaerobic treatment of primary municipal sludge. (Author)

PB-215 189
Public Health Service, Portland, Oreg. Div of Water Supply and Pollution Control.
IRRIGATION RETURN FLOW STUDY WAPATO IRRIGATION DISTRICT YAKIMA RIVER BASIN, WASHINGTON.
May 64, 31p Working Paper-47
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Yakima River Basin, *Water pollution), (*Ground water recharge, Yakima River Basin), (*Washington (State), Water pollution), (*Columbia River Basin, Water pollution), (*Irrigation, Water pollution).
Identifiers: Return flow.

A study of return flows in the Wapato Irrigation District in the Yakima River Basin in central Washington was made during the 1963 irrigation season to determine effects of the (principally) irrigation use on water quality. Parameters investigated included temperature, oxygen demand, hardness, turbidity, coliform bacteria, pesticide toxins, and various nutrient ions. Some degradation of quality was observed for nearly every parameter, but the overall effect was not severe. The chief recommendations for improvement of water quality involve improvements in amount and timing and method of application of the irrigation water, and a continuing educational safety campaign on use of pesticides. (Author)

PB-215 190
Sanitary Engineering Center, Cincinnati, Ohio.

PLANKTON REMOVAL TESTS AND POTABLE WATER SURVEY AT NAVAL STATION, ARGENTIA, NEWFOUNDLAND.
C. Mervin Palmer, and Hayse H. Black. Jan 55, [illegible]p
Report to Department of the Navy Bureau of Yards and Docks, Washington, D. C.

Descriptors: (*Water supply, Phytoplankton), (*Phytoplankton, *Water treatment), Algae, Filtration, Sedimentation, Coagulation, Sanitary engineering, Potable water, Reservoirs, Bacteria, Chlorination, Canada.
Identifiers: *Argentia (Canada).

The report pertains primarily to intensive studies conducted at Argentia, Newfoundland during the period August 20 to August 31, 1954. The number of planktonic algae in the tap water at Argentia Naval Base was determined. Diatomite filtration was proved effective in removal of algal forms present in the water received at the naval base power station during the period of the test. Limited tests on small scale showed efficient removal of algae by coagulation and sedimentation. Survey of the naval base water supply from the standpoint of potability consisted of an inspection of the physical facilities at Clarks Pond pumping station and review of available bacteriological and residual chlorine records.

PB-215 191
Communicable Disease Center, Atlanta, Ga.
PROCEEDINGS OF SYMPOSIUM ON COCCIDIOIDOMYCOSIS HELD AT PHOENIX, ARIZONA - FEBRUARY 11-13, 1957,
Malcolm S. Ferguson. Dec 57, 200p PHS-Pub-575
Sponsored in part by The Arizona State Department of Health, The Arizona Chapter of the American Coll. of Chest Physicians, and the Phoenix City Health Dept., Ariz.

Descriptors: (*Coccidioidomycosis, *Meetings), (*Fungus diseases, Meetings), Coccidiodes, Infections, Epidemiology, Ecology, Immunology, Pathology, Therapy, Diagnosis.
Identifiers: *Coccidioides immitis.

Coccidioidomycosis inspired the interest of only a few investigators in the United States prior to World War II. Valley fever, desert rhematism, or San Joaquin fever -- as it was commonly known -- appeared to be of local and limited concern. During the war, however, many military bases were established in the semi-arid endemic regions of the Southwest and almost overnight the disease became a major medical problem confronting the Armed Forces. Thousands of personnel stationed in the endemic areas developed disabling and occasionally fatal cases of coccidioidomycosis. Since that time, skin test surveys have shown that millions of people in this country have been infected by Coccidioides immitis and that thousands of new infections occur each year. Publication of these proceedings makes the wealth of material presented on the epidemiology, ecology, immunology, pathology, diagnosis, and treatment of one of man's most important mycotic diseases available to investigators everywhere.

PB-215 192
Federal Water Quality Administration, Chicago, Ill. Great Lakes Region.
CHEMISTRY LABORATORY MANUAL BOTTOM SEDIMENTS.

Dec 69, 106p

Descriptors: (*Sediments, Chemical analysis), Cyanides, Iron, Trace elements, Metals, Nitrogen, Oils, Pesticides, Phenols, Phosphous, Solids, Inorganic sulfides, Manganese.
Identifiers: Chemical oxygen demand.

The report presents the techniques used to analyse sediments in the Great Lakes. Step by step procedures are given for the analysis of chemical oxygen demand, cyanide, iron, metals, nitrogen, oil and grease, oxygen demand and chlorine demand, pesticides, phenol, phosphorus, solids, sulfide, silica, manganese, and oxidation reduction potentials.

PB-215 193
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS, NATIONAL AIR SURVEILLANCE NETWORKS. 1967 DATA TABULATIONS AND SUMMARIES, WASHINGTON, D.C.

Apr 69, 98p APTD-69-11

Descriptors: (*District of Columbia, *Air pollution).
Identifiers: *Air quality data.

One of the Continuous Air Monitoring Projects of the National Air Surveillance Networks is to routinely operate continuous monitoring stations in six major cities. The data tabulations in the report consist of hourly average concentrations of five gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, and total oxidants), and 2-hour measurements of soiling index levels in Washington, D.C., during 1967. Similar data were gathered for a sixth gaseous pollutant, total hydrocarbons. A brief summary of monthly means and maximums and graphs of seasonal diurnal patterns of gaseous pollutants at the Washington, D.C., station are included. Annual frequency distributions of the data pertaining to gases and soiling index are presented for all six CAMP stations.

PB-215 194
Environmental Health Center, Cincinnati, Ohio.
DENVER, COLORADO, SEWAGE TREATMENT PLANT STUDY.

Apr 51, 40p

Descriptors: (*Sewage treatment, *Activated sludge process).
Identifiers: Sewage treatment plants.

The study of the Denver sewage treatment plant was begun in mid-January, 1950, and continued until the end of March, 1950. The purpose of this study was to measure the efficiency of the Denver plant and to evaluate the benefits of the return of primary sludge with aeration. (Author)

PB-215 195
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
SEDIMENT PRODUCTION RATING CHEHALIS RIVER BASIN, WASHINGTON.

19 Jun 62, 8p Working Paper-24
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Chehalis River Basin, *Sediment transport), (*Washington (State), *Water pollution).

The sediment production rating is based on field inspection of representative portions of the Chehalis Basin to determine extent of the sediment problem, to locate sediment source areas, and to estimate total sediment movement within the basin. The report discusses the sediment production rating given the Chehalis River Basin. (Author)

PB-215 196
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SUGGESTED STATE WATER POLLUTION CONTROL ACT AND EXPLANATORY STATEMENT.
Oct 50, 26p PHS-Pub-49

Descriptors: (*Water pollution, *Legislation), State government.

Increasing interest in development and conservation of our country's water resources has been reflected in the concern which legislatures have shown with the problem of water pollution. Within the last decade more than half the States have adopted new legislation in this field or strengthened existing laws, and in 1948 the Congress passed the Water Pollution Control Act, the first attempt by the Federal Government to join with the States in a comprehensive attack on the problem as a whole. A 'Suggested State Water Pollution Control Act' has been prepared as a part of this effort. The underlying concept and purpose of the paper is to facilitate interstate cooperation for a more concerted attack on water pollution. (Author)

PB-215 197
Public Health Service, Portland, Oreg. Region IX.
ROGUE RIVER BASIN, OREGON. MEDFORD DIVISION. BEAR CREEK.
Oct 65, 35p

Descriptors: (*Rogue River Basin, *Reservoirs), (*Oregon, *Water resources), Bear Creek, River basin development.
Identifiers: *Jackson County (Oregon).

The investigation was undertaken to determine the potential need for and value of storage for regulation of streamflows for water quality control in the Rogue River Basin Project, Medford Division, Jackson County, Oregon. The scope of this study was limited to determination of water quality control requirements within the Bear Creek portion of the Medford Division. Study elements included projection of the population and industry growth, determination of sources, and effects of present and future waste loadings, an examination of the hydrology of the area, a determination of the assimilative capacity of the stream, a determination of stream uses and required quality objectives, a projection of adequate treatment levels and flow requirements necessary to protect stream uses, and consideration of alternative methods, costs, and values of meeting water quality requirements.

PB-215 198
Bureau of Water Hygiene, Cincinnati, Ohio.
COMMUNITY WATER SUPPLY STUDY. SIGNIFICANCE OF NATIONAL FINDINGS.

Jul 70, 17p
See also PB-214 982.

Descriptors: (*Water supply, *Water quality), (*Water pollution, Water supply), (*United States, Water supply).

The Community Water Supply Study concerns the current and future healthfulness and dependability of the drinking water supplied to over 150 million Americans by community water supply systems. The remaining population drinks from private supplies. The purpose of the study was to determine the quality of drinking water being delivered to the over 18 million people in the study areas and the health risk factors that enabled scientists and engineers to evaluate the ability of these systems to continue to provide adequate supplies of safe water now and in the future. (Author)

PB-215 199
Environmental Health Center, Cincinnati, Ohio.
SEPTIC TANKS AND DISPOSAL FIELDS,
James B. Coulter. 1953, 27p

Descriptors: (*Septic tanks, Reviews), (*Soil properties, Septic tanks).

The report describes results obtained from investigations performed to ascertain the effects certain additives-starter compounds, ground garbage, detergents, water softeners-have on residential septic tanks. Tank configuration and soil studies are also discussed.

PB-215 200
Pacific Northwest Water Lab., Corvallis, Oreg.
THERMAL EFFECTS ON ECOLOGICAL SYSTEMS,
A. F. Bartsch, and D. I. Mount. 1970, 8p
Prepared in cooperation with National Water Quality Lab., Duluth, Minn.

Descriptors: (*Water pollution, Heat), Ecology.
Identifiers: *Thermal pollution, *Water pollution effects (Animals).

The report describes the adverse relationship between water temperature changes and the aquatic ecology.

PB-215 201
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY CONTROL STUDY. CHIKASKIA RIVER BASIN, KANSAS AND OKLAHOMA.

Aug 65, 31p

Descriptors: (*Chikaskia River Basin, *Water pollution), (*Kansas, Water pollution), (*Oklahoma, Water pollution), Reservoirs.

A study has been made of the need for and value of storage in Caldwell and Corbin Reservoirs for water quality control purposes in the Chikaskia River basin. The investigation revealed an immediate need for water quality improvement in Bluff Creek downstream from the Caldwell Reservoir site. Anticipated seepage losses from this reservoir will be adequate to maintain satisfactory water quality for expected uses and have attributable value. No need was found for storage for water quality control purposes in either reservoir. Future municipal and industrial water uses, used as the basis for estimating waste releases for this study, were provided by the Bureau of Reclamation with the exception of those projected for the Blackwell area which were adapted from a previous Public Health Service study. (Author)

PB-215 202
Public Health Service, Savannah, Ga. Technical Development Labs.
COMPOSTING OF ORGANIC WASTES - AN ANNOTATED BIBLIOGRAPHY,
John S. Wiley. Feb 58, 128p

Descriptors: (*Waste disposal, Composts), (*Bibliographies, *Composts).
Identifiers: *Solid waste disposal.

A survey of the literature on the composting of organic wastes was made concurrent with research work by the Communicable Disease Center, Technical Development Laboratories. This bibliography, with abstracts and occasional editorial remarks, may serve as a source of information for those interested in the subject. The subject matter is limited to composting which may be defined as a process in which microorganisms break down organic matter to a relatively stable humus-like material. (Author)

PB-215 203
Federal Water Pollution Control Administration, Washington, D.C.
PROJECT REGISTER. DISTRIBUTION BY RIVER BASIN OF PROJECTS APPROVED UNDER SECTION 8 OF THE FEDERAL WATER POLLUTION CONTROL ACT, (PUBLIC LAW 660, 84TH CONGRESS), AS AMENDED.

30 Jun 69, 123p

Descriptors: (*Sewage treatment, *Grants).

A tabulation is presented of the 1969 sewage treatment projects for twenty river basins of the United States and possessions.

PB-215 204
Federal Water Quality Administration, Washington, D.C.
PROJECT REGISTER, JUNE 30, 1970. DISTRIBUTION BY RIVER BASIN OF PROJECTS APPROVED UNDER SECTION 8 OF THE FEDERAL WATER POLLUTION CONTROL ACT, (PUBLIC LAW 660, 84TH CONGRESS), AS AMENDED.
30 Jun 70, 130p

Descriptors: (*Grants, *Sewage treatment).
Identifiers: *Register project.

A listing, with statistical data, is given for the 1970 sewage treatment projects in twenty river basins of the United States and possessions.

PB-215 205
Federal Water Pollution Control Administration, Washington, D.C.
PROJECT REGISTER. DISTRIBUTION BY RIVER BASIN OF PROJECTS APPROVED UNDER SECTION 8 OF THE FEDERAL WATER POLLUTION CONTROL ACT, (PUBLIC LAW 660, 85TH CONGRESS), AS AMENDED.

30 Sep 68, 200p

Descriptors: (*Sewage treatment, *Grants).

A tabulation is given of the 1968 sewage treatment projects for nineteen river basins of the United States and possessions.

PB-215 206
Public Health Service, San Francisco, Calif. Region IX.
SOQUEL-APTOS CREEK BASINS, SANTA CRUZ COUNTY, CALIFORNIA. PRELIMINARY REPORT ON FUTURE MUNICIPAL AND INDUSTRIAL WATER USES.
May 63, 49p

Descriptors: (*California, *Water supply), Water consumption, Soquel Creek Basin, Aptos Creek Basin.
Identifiers: *Santa Cruz County (California).

The purpose of the report is to present projections of future municipal and industrial water use to the year 2060 in the Soquel and Aptos Creek Basins and to examine some alternative sources of water supply for the area. The alternative water supply sources provide a basis for estimating the value of the municipal and industrial water stored in the proposed Soquel and Aptos developments by the alternative cost method.

PB-215 207
Pacific Northwest Water Lab., Corvallis, Oreg.
INVENTORY OF RESEARCH IN WATER POLLUTION AND OTHER RELATED FIELDS, COLUMBIA BASIN AND PACIFIC COAST STATES,
Lyman J. Nielson. Nov 66, 140p

Descriptors: (*Water pollution, Research), Pacific Northwest, Columbia River Basin, California.

The report is the seventh inventory of water pollution research for the Columbia River Basin and Pacific Coast States. In addition to the customary abstract of each research project, the report provides information relating to distribution of efforts in various areas of water pollution research. Each researcher submitting data for the inventory was asked to indicate the pertinent research area or areas of his project. The data submitted are given in three tables. (Author)

PB-215 208
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
GENERAL SITE CHARACTERISTICS AND BASIC DATA NEEDS FOR THERMAL POWER PLANT SITE EVALUATION.
Apr 70, 10p

Descriptors: (*Electric power plants, *Site surveys), (*Water pollution, Electric power plants).
Identifiers: *Water pollution abatement.

Thermal power plant siting in the Northwest to date has lacked adequate consideration of aquatic environmental aspects, site safety and economics having been primary considerations. The Federal Water Pollution Control Administration (FWPCA) considers that aquatic environmental aspects are equally important. The document describes data which are necessary for satisfactory evaluation of selected power plant sites, relative to applicable water quality standards and FWPCA policy.

PB-215 209
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ON THE STUDY TO: DETERMINE IF DISTRIBUTION BOXES CAN BE ELIMINATED WITHOUT INDUCING INCREASED FAILURE OF DISPOSAL FIELDS.
Final rept.,
James B. Coulter, Thomas W. Bendixen, W. F. Smith, Sr., and A. J. Muhich, Jr. 19 Feb 58, 45p

Descriptors: (*Septic tanks, *Soil properties).

The report deals exclusively with a comparison of the performance of septic tank-soil absorption systems, some with and some without distribution boxes. Investigations were conducted from the St. Louis County, Missouri; the Rapides Parish (Alexandria), Louisiana; and the Caddo-Shreveport Parish, Louisiana Health Departments. (Author)

PB-215 210
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
POLLUTION OF INTERSTATE WATERS OF THE MISSISSIPPI RIVER IN THE ST. LOUIS METROPOLITAN AREA.
Feb 58, 32p
Prepared in cooperation with State of Missouri, Division of Health; Bi-State Development of the Missouri-Illinois Metropolitan Area; State of Illinois Sanitary Water Board; and Public Health Service.

Descriptors: (*Mississippi River, *Water pollution), (*Missouri, Water pollution).
Identifiers: *Saint Louis (Missouri).

The St. Louis Metropolitan Area surrounds the confluence of two of America's largest rivers, the Mississippi and the Missouri. The Mississippi is, in fact, so large at St. Louis, and downstream, that it has gained the reputation of being practically immune to damage by pollution. This reputation is not justified, as is shown by the report of the Bi-State Development Agency, Mississippi River Water Pollution Investigation St. Louis Metropolitan Area, published in 1954 in cooperation with the States of Illinois and Missouri and the U. S. Public Health Service. The present report draws heavily on that excellent publication for basic data, facts, and conclusions. For the report data on sources of waste have been brought up to date and additional data including especially those on bacterial quality from several water supplies, have been assembled. Additional computations, based on the 1951-1952 data on bacterial contamination, oxygen demand, and dissolved oxygen both support and supplement the conclusions of the 1954 report.

PB-215 211
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.

MUNICIPAL WATER NEEDS IN THE PACIFIC NORTHWEST TO THE YEAR 2020,
Warren C. Westgarth. Feb 65, 27p Working Paper-54
Report on Columbia River Basin Comprehensive Project for Water Supply and Pollution Control.

Descriptors: (*Water consumption, *Pacific Northwest), (*Forecasting, Water consumption).

How much water does City X, with 12,000 inhabitants residing along the Snake River require to satisfy its municipal needs for the month of July of the year 2010. In the Columbia River Basin Comprehensive Project the requirement exists for reasonable values of municipal per capita water needs in the Pacific Northwest for the design years from 1960 through 2020. Because of the differences shown by the data at hand, it was necessary to study the Northwest as a separate area in order to derive reasonable projected per capita needs. The derived values in this paper were calculated for use in comprehensive planning and may not fit the requirements of consulting engineers and others who are interested in specific municipalities.

PB-215 212
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
A SYSTEM FOR STORAGE AND RETRIEVAL OF WATER USE INVENTORY DATA,
Daniel L. Petke. Dec 66, 15p Working Paper-59
Report on Columbia River Basin Comprehensive Project for Water Supply and Water Quality Management.

Descriptors: (*Data retrieval, *Water resources).

Because of a definite and immediate need for a detailed inventory of present and potential water uses, in addition to the lack of an operating system for compiling such information, a simple, but workable, system has been developed for the storage and retrieval of water use inventory data.

PB-215 213
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
RECONNAISSANCE INVESTIGATION, WATER SUPPLY AND WATER QUALITY CONTROL STUDY. BEAVER CREEK WATERSHED, OREGON.
Jun 66, 10p

Descriptors: (*Beaver Creek Watershed, *Water supply), (*Oregon, Water supply).

A reconnaissance survey has been made which discloses a need for storage for municipal water supply in the Beaver Creek Watershed, Oregon. No need is foreseen in the basin for water quality control storage. This conclusion is based on economic, demographic, and engineering studies. A detailed study will be conducted should specific storage sites be considered in the future.

PB-215 214
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
HOUSEHOLD SEWAGE DISPOSAL SYSTEMS,
S. R. Weibel. 1954, 16p
Presented at Interamerican Conference of Sanitary Engineering (4th) at Sao Paolo, Brazil, 25-31 July 1954.

Descriptors: (*Septic tanks, Reviews).

The use of septic tanks is discussed in aspect to their design. This includes a discussion of the types available, site location, and soil tests.

PB-215 215
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BACTERIOLOGICAL CRITERIA FOR MARKET OYSTERS,
Technical rept.,
C. B. Kelley. 1960, 18p SEC-TR-F60-2

Descriptors: (*Water pollution, Food contamination), (*Oysters, *Food contamination), (*Shellfish, *Bacteriology), (*Seafood, *Bacteriology), Standards, Bacteria, Indexes (Ratios), Fisheries, Regulations, Food processing, Water pollution.

The past few years have seen increased interest in the determination of bacteriological quality of shellfish as received at the market. Some agencies established either official or tentative working standards by which they could at least classify the product as received. Possibly the most notable is the classification system established by Canada in 1951, which groups the shellfish into three classes, Acceptable, Acceptable on Condition, and Rejectable, and allows judgment whether a product should enter or be tolerated in the consuming area. Because of the success of Canada with this scheme, the method was accepted in principle at the Shellfish Sanitation Workshop, with the modification of extending the coliform MPN limit in the Acceptable class from 2,400 to 16,000. The bacteriological criteria established at the 1956 Shellfish Sanitation Workshop is summarized.

PB-215 216
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A REVIEW OF INTERSTATE POLLUTION. THE POTOMAC RIVER IN THE WASHINGTON METROPOLITAN AREA,
F. W. Kittrell, and W. H. Davis. Jun 57, 38p

Descriptors: (*Water pollution, *Potomac River).
Identifiers: *Washington Metropolitan Area, *Water quality data.

The report presents 1957 water quality data for the Potomac River in the Washington Metropolitan Area.

PB-215 217
National Field Investigations Center, Cincinnati, Ohio.
INVESTIGATION OF MERCURY IN THE ST. CLAIR RIVER - LAKE ERIE SYSTEMS.

May 70, 113p
Prepared in cooperation with the Great Lakes Regional Office, Lake Huron Basin Office, and Lake Erie Basin Office, Federal Water Quality Administration.

Descriptors: (*Saint Clair River, *Mercury), (*Lake Erie, *Mercury), (*Water pollution, Mercury), Industrial wastes.

Data provided by the Bureau of Commercial Fisheries, Technological Laboratory, Ann Arbor, Michigan, show that mercury was present in fish throughout the St. Clair River - Lake Erie System. Available information indicates that no measurable concentration of mercury was present in water supply intakes in the St. Clair - Lake Erie System. Mercury in excess of 1 mg/kg dry weight was present in sediments in the Erie, Pennsylvania, and Euclid and Cleveland, Ohio, areas and the Buffalo, Black, and Ashtabula rivers. The waters of the study area revealed no mercury except for one sample collected at mile point 13.3. The Detroit River area is the primary source of mercury in the western end of Lake Erie. This is revealed by the distribution pattern established through sediment samples.

PB-215 218
Federal Water Pollution Control Administration, Needham Heights, Mass. New England Basins Office.
A MULTIPLIER FOR COMPUTING THE VALUE OF SHELLFISH,
Edward F. M. Wong. Oct 68, 21p CWT-10-9

Descriptors: (*Shellfish, Value), (*Economic analysis, Shellfish), Estimating, Production, Economic factors, Supply (Economics).

The objective of this study is to find a simple method for determining the economic value of a community's commercial shellfish production or of its potential resource--its supply of available shellfish in the natural environment. (Author)

PB-215 219
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
WATER POLLUTION IN THE GRAND--CHARITON DRAINAGE BASINS.
Water pollution series.
Jun 52, 52p PHS-WPS-22

Descriptors: (*Grand River Basin, *Water pollution), (*Chariton River Basin, *Water pollution), (*Iowa, Water pollution), (*Missouri, Water pollution).

The report is produced under the coauthorship of the Missouri Division of Health, Iowa Department of Health, and the Public Health Service. It is based on data available as of June 1, 1952, on sources of pollution, treatment facilities employed, and stream conditions of the Grand-Chariton River Basins. The report also presents information concerning water resource use, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect and those which are needed.

PB-215 220
Federal Water Pollution Control Administration, Boston, Mass. Northeast Region.
REPORT ON POLLUTION OF THE NAVIGABLE WATERS OF BOSTON HARBOR.
May 68, 89p

Descriptors: (*Boston Harbor, *Water pollution), (*Shellfish, Boston Harbor), (*Massachusetts, Water pollution).
Identifiers: *Water quality data.

The report presents information on the sources of water pollution and its effects to the shellfish of Boston Harbor. Also reported are water quality data and the pollution control agencies involved.

PB-215 221
Public Health Service, Cincinnati, Ohio.
STUDY OF SLUDGE BULKING AT THE LANCASTER, PA. SEWAGE TREATMENT PLANT, NOVEMBER 20-26, 1935,
W. C. Purdy, and Russell S. Smith. 20 Dec 35, 16p

Descriptors: (*Sewage treatment, *Activated sludge process).

Lancaster, Pennsylvania has two practically new, activated sludge type sewage treatment plants, known as the North Plant and the South Plant. The two plants are identical in type, number and size of units, although, due to topographical conditions, the physical arrangement of the units is different. Considerable trouble has been experienced with bulking of the sludge at the South Plant. The report discusses an analysis of the problem to find its cause.

PB-215 222
Environmental Health Center, Cincinnati, Ohio.
REVIEW OF RESEARCH GRANTS PROGRAM OF NATIONAL INSTITUTES OF HEALTH AS RELATED TO RESEARCH IN ENVIRONMENTAL HEALTH,
C. C. Ruchhoft. 1949, 15p
Presented at Florida Public Health Engineering Conference, 19 Nov 49, at Gainesville, Fla.

Descriptors: (*Water pollution, *Grants).

The purpose of the paper is to review the Public Health Service Research Grants Program as related to research in environmental health to aid those who are interested in applying for grants including studies of water purification, sewage treatment, and the pollution of lakes and streams.

PB-215 223
Public Health Service, Dallas, Tex. Region VII.
WATER RESOURCES STUDY. PECAN BAYOU WATERSHED, COLORADO RIVER BASIN, TEXAS.
Oct 62, 35p

Descriptors: (*Water pollution, *Pecan Bayou Watershed), (*Colorado River Basin, Water pollution), (*Texas, Water pollution).

The report indicates the requirements for municipal, industrial, and water quality control purposes to the year 2070 in the Pecan Bayou watershed. Estimates are made of the benefits attributable to the storage of water for these purposes in proposed Federal reservoirs. (Author)

PB-215 224
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REACTION OF DIMETHYLAMINOBENZALDEHYDE IN SULFURIC ACID WITH LIQUID OLEFINS,
A. P. Altshuller, and S. F. Sleva. 1961, 12p

Descriptors: (*Alkene hydrocarbons, *Colorimetric analysis), (*Spectroscopic analysis, Alkene hydrocarbons).
Identifiers: *Benzaldehyde/dimethylamino.

The analysis of trace quantities of gaseous and vapor state olefins by reaction with dimethylaminobenzaldehyde (DAB) reagent in concentrated sulfuric acid has been reported, elsewhere. Thissame reagent also reacts with liquid olefins to form similar products also having strong absorption bands in the 500 micro meter region. The liquid olefins have been studied using somewhat different reaction conditions; consequently the positions, shapes, and intensities of the absorption bands differ somewhat from those reported in the vapor phase studies. Although the work done on liquid olefins was not as extensive as in the investigation of olefin gases and vapors, the results should have applicability in the identification and analysis of small quantities of liquid olefins. (Author)

PB-215 225
Public Health Service, Dallas, Tex. Western Gulf and Colorado River Drainage Basins Office.
WESTERN GULF DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.

1951, 82P PHS-WPS-8 PHS-Pub-92
Prepared in cooperation with Colorado State Dept. of Health, Louisiana Stream Control Commission, New Mexico Dept. of Public Health, and Texas State Dept. of Health.

Descriptors: (*Water resources, *United States), (*Water pollution, *Texas), (*New Mexico, *Water pollution), Louisiana, Colorado.

The report present information about the ways our water resources are used, the pollution going into our water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required. The report is in two parts. Part one considers the water pollution problems of the basin as a whole. Part two presents briefly the data for each of the several sub-basins of the major basin, including a list of projects now known to be needed for water pollution control. (Author)

PB-215 226
Environmental Health Center, Cincinnati, Ohio.
REVIEW OF JAMES RIVER INVESTIGATION, WITH REFERENCE TO PORPOSED GATHRIGHT RESERVOIR AND FALLING SPRING REREGULATING DAM,
Donald D. Gold, and William A. Gorman. Aug 53, 34p

Descriptors: (*Water pollution, *Jackson River), (*Gathright Reservoir, Water pollution), (*Virginia, Water pollution).

The report has neen prepared at the request of the District Engineer, Corps of Engineers, Norfolk, Virginia. The report is on the Gathright-Falling Spring Reservoir on the Jackson River, a headwater tributary of the James River, Virginia. The paper presents progress in pollution abatement since 1949.

PB-215 227
Environmental Health Center, Cincinnati, Ohio.
INDUSTRIAL WASTES ALONG THE NIAGARA FRONTIER AND THEIR EFFECT ON THE INTERNATIONAL BOUNDARY WATERS,
Hayse H. Black, and Earl Devendorf. 1954, 61p
Prepared in cooperation with New York State Dept. of Health, Albany. Presented at Annual Meeting (26th) of New York Sewage and Industrial Wastes Association, 21-22 Jan 54, New York City.

Descriptors: (*Niagara River, *Water pollution), (*Buffalo River, *Water pollution), (*New York, Water pollution), Sources, Industrial wastes, International relations, Canada.

The report describes, for international boundary waters of the Niagara River, principle pollution sources, pollutional constituents, pollution effects, and progress made toward pollution control.

PB-215 228
Columbia Univ., New York. Dept. of Chemical Engineering.
FLOCCULATION OF CRYSTALLINE QUARTZ WITH POLYALKYLENEAMINE POLYMERS.
Final progress rept.,
J. K. Dixon, Victor K. La Mer, and Henry B. Linford. 31 Mar 65, 19p
Grant PHS-WP-00240-03

Descriptors: (*Flocculating, *Quartz), (*Polyelectrolytes, *Flocculants).
Identifiers: Poly (imino-ethylene).

The previous studies of La Mer et al on the flocculation of fine quartz dispersions with ionic polymers, as measured by refiltration rates and electrophoretic mobilities, are being continued. Emphasis is placed on the effect of molecular weight and molecular architecture of cationic polymers on flocculation phenomena. Polyalklene amines, for example, triethylene tetramine and polyethylene imine, with molecular weights ranging from 150 to 75,000 have been studied. (Author)

PB-215 229
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A PREDICTION MODEL OF MEAN URBAN POLLUTION FOR USE WITH STANDARD WIND ROSES,
Francis Pooler, Jr. 1958, 25p

Descriptors: (*Air pollution, *Sulfur dioxide), (*Atmospheric diffusion, Air pollution), (*Tennessee, Air pollution).
Identifiers: *Air quality data, *Nashville (Tennessee).

An empirical diffusion equation is used with an estimated inventory of SO2 emissions for Nashville, Tennessee, to compute monthly mean SO2 concentrations. Results are compared with patterns of concentrations obtained from a network of lead peroxide candle measurements. Reasonable agreement is found between computed and observed values; topographic effects are also indicated. Relative monthly emission rates deduced from the comparisons are used to show the effect of space heating requirements.

PB-215 230
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SPOT TEST DETECTION AND COLORIMETRIC DETERMINATION OF ANILINE, NAPHTHYLAMINE AND ANTHRAMINE DERIVATIVES WITH 4- -AZOBENZENEDIAZONIUM FLUOBORATE,
Eugene Sawicki, James L. Noe, and Francis T. Fox. 1959, 17p

Descriptors: (*Amines, *Colorimetric analysis), (*Spectroscopic analysis, Amines), (*Anilines, Colorimetric analysis), (*Diazotization, *Amines), Spot tests.

Some new sensitive procedures are introduced for the detection and determination of aniline, alpha and beta-naphthylamines, and alpha- and beta-anthramines, as well as their N-alkyl and N,N-dialkyl derivatives. The chromogens are (p-phenylazophenylazo) - aniline, -naphthylamine and -anthramine dyes. For example with N,N-dimethylaniline, the blue dication of N,N-dimethyl-p- (p-phenylazophenylazo) aniline is formed. Because of the widely differing rates of reaction naphthylamine or anthramine derivatives can be determined in the presence of aniline derivatives. Also, with the help of a masking agent a dialkylaniline can be determined in the presence of primary and secondary amines. Spot tests for aniline, naphthylamine and anthramine derivatives are described.

PB-215 231
Pacific Northwest Water Lab., Corvallis, Oreg.
QUARTERLY PROGRESS REPORT, OCTOBER 1-DECEMBER 31, 1970.
Jan 71, 38p

Descriptors: (*Water pollution, Research).
Identifiers: *Pacific Northwest Water Laboratory.

The report is a compilation of research studies relative to waste treatment, thermal water pollution, seacoast pollution, and eutrophication.

PB-215 232
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN ALBUQUERQUE INTRASTATE AIR QUALITY CONTROL REGION (NEW MEXICO).

Jul 70, 49p APTD-1212

Descriptors: (*New Mexico, *Air pollution).
Identifiers: *Albuquerque (New Mexico), *Air quality data.

The basic background information is presented for the consultation with state and local authorities prior to the designation of air quality control regions as stipulated in the Clean Air Act. Boundaries for the regions are proposed and the factors which are the basis for the proposed boundaries are discussed. The report considers the factors: geography; population and economic activity; their prospective growth; probable direction of physical growth; the emission inventory and the location of sources; air quality and pollution transport analysis; regional planning; air pollution control; and governmental jurisdictions. (Author)

PB-215 233
Minnesota Univ., St. Paul. Dept. of Biochemistry.

DEMONSTRATION OF THE 'CHANNEL AERATION PROCESS' IN TREATMENT OF SEWAGE, GLENWOOD, MINNESOTA.

Nov 66, 4p

Descriptors: (*Sewage treatment, Lagoons (Ponds)), Channels (Waterways).
Identifiers: *Aeration ponds, Glenwood (Minnesota).

The oxidation channel treatment plant constructed at Glenwood, Minnesota, was set up as a demonstration plant to determine whether or not this process would be more efficient in the removal of nitrogen from sewage than has been the experience with other types of biological treatment. It was felt that with this type of process it would be possible to satisfy the biochemical oxygen demand of the sewage with a minimum amount of oxygen that would maximize (1) the storage of nitrogen in the microbial protoplasm and (2) also release of gaseous nitrogen through denitrification. (Author)

PB-215 234
Environmental Health Center, Cincinnati, Ohio.
A STUDY OF THE CONCENTRATION AND ESTIMATION OF ORGANIC CHEMICAL COMPOUNDS IN RAW AND FILTERED SURFACE WATERS,
Harry Braus, F. M. Middleton, and Graham Walton. 18 Apr 50, 21p
Presented at National Meeting of the American Chemical Society (117th), 17-19 Apr 50, Detroit, Mich.

Descriptors: (*Water analysis, *Water pollution), (*Activated carbon, Water analysis).
Identifiers: *Water pollution detection.

A knowledge of the kinds and concentrations of organic chemical compounds in surface waters is important and useful in studies concerned with tastes and odors in drinking water, natural purification of streams, analysis and tracing of industrial wastes, and toxic and other physiological effects on man and animal. Direct analysis for most organic compounds is not usually possible due to the minute concentrations which normally occur in surface waters. The report describes a method for the concentration and estimation of organic compounds in raw and filtered surface water. Possible applications of the techniques presented are discussed. (Author)

PB-215 235
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE SOUTHERN LOUISIANA-SOUTHEAST TEXAS INTERSTATE AIR QUALITY CONTROL REGION. (LOUISIANA-TEXAS).

Apr 70, 135p APTD-1206

Descriptors: (*Louisiana, *Air pollution), (*Texas, *Air pollution).
Identifiers: *Air quality data.

The Clean Air Act, as amended, directs the Secretary of Health, Education, and Welfare to designate 'air quality control regions' to provide a basis for the adoption of regional air quality standards and the implementation of those standards. The Act stipulates that the designation of a region shall be preceded by consultation with appropriate State and local authorities. The report is intended to provide the basic background information needed for the consultation. It proposes boundaries for the Southern Louisiana-Southeast Texas Interstate Air Quality Control Region and discusses the factors which are the basis of the proposed boundaries. (Author)

PB-215 236
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WALLA WALLA PROJECT: MARCUS WHITMAN DIVISION, WASHINGTON AND MILTON--FREEWATER DIVISION, OREGON.
Water quality control study.

Jul 67, 68p

Descriptors: (*Water pollution, *Walla Walla River Basin), (*Washington (State), Water pollution).

A study has been made which discloses a need for storage in Walla Walla River Basin for streamflow regulation for water quality control. Future water requirements and quality projections are based on economic, demographic, and engineering studies.

PB-215 237
Public Health Service, San Francisco, Calif. Pacific Southwest Drainage Basins Office.
REPORT ON WATER POLLUTION CONTROL, SAN JOAQUIN RIVER DRAINAGE BASIN, CALIFORNIA.
Water pollution series.
1953, 83P PHS-Pub-286, PHS-WPS-49

Descriptors: (*San Joaquin River Basin, *Water pollution), (*California, Water pollution).

The report for the San Joaquin River Basin was prepared by the California and Great Basin Drainage Basins Office of the Public Health Service. It is based upon data, current as of January 31, 1953, provided primarily by the staff of the Central Valley Regional Water Pollution Control Board of California. The report presents information concerning use of water resources, waste discharges to water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect and those needed.

PB-215 239
Texas State Dept. of Health, Austin. Div. of Occupational Health.
APPRAISAL OF AIR POLLUTION IN TEXAS.
Rept. for Dec. 57-Jul 58,
Otto Paganini, Marvin D. High, and Paul A. Kenline. 1958, 114p
Prepared in cooperation with Public Health Service, Washington, D.C.

Descriptors: (*Texas, *Air pollution).

A state-wide appraisal of the factors relative to air pollution in Texas resulted from the interest and concern expressed by citizens and organizations. A general appraisal to determine the status of air pollution in the state and the need for additional activity on the part of the state government in meeting its air pollution problems.

PB-215 240
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
INSTRUMENTS FOR THE DETECTION AND IDENTIFICATION OF RADIOACTIVITY IN ENVIRONMENTAL MEDIA.
Technical rept.,
Conrad P. Straub, Gerald J. Karches, and Byron M. Branson. 1959, 13p SEC-TR-R59-3
Contract AT- (49-5)-1288

Descriptors: (*Radiation measuring instruments, Reviews).

The paper describes and illustrates the variety of instruments available at the Center for measurement of radioactivity in various environmental media. Shown are instruments that may be used for the measurement of gross radioactivity; those for measuring specific kinds of radioactivity as from alpha, beta, or gamma emitters; and instruments such as the gamma spectrometer for identification of specific radionuclides. (Author)

PB-215 241
Environmental Health Center, Cincinnati, Ohio.
A STUDY OF THE CHARACTERISTICS OF LIQUID WASTES FROM AN INTEGRATED STEEL MILL.
Industrial waste survey rept., 21 May-23 Jun 51,
G. N. McDermott, and D. M. Taylor. 23 Jun 51, 152p
Prepared in cooperation with United States Steel Co., Geneva Works, Columbia-Geneva Div.

Descriptors: (*Water pollution, *Industrial wastes), (*Iron and steel industry, Water pollution).
Identifiers: *Geneva (Utah).

The survey was made in connection with the program of industrial waste studies being conducted by the Public Health Service in co-operation with State health departments and other agencies concerned. Three major sources of wastes were surveyed, namely: the blast furnace area, coke, and rolling mill departments. The water supply systems and waste lines were also examined. Summaries of each of these studies are given for the Geneva Steel Mill, Geneva, Utah. (Author)

PB-215 247
Environmental Health Center, Cincinnati, Ohio.
REVIEW OF SEWAGE AND INDUSTRIAL WASTE LITERATURE-1949. I. STREAM POLLUTION. II. ANALYTICAL METHODS,
M. B. Ettinger, Max Katz, W. A. Moore, C. C. Ruchhoft, and L. R. Setter. Jan 50, 39p

Descriptors: (*Water pollution, *Legislation), (*Water analysis, Water pollution), Reviews.
Identifiers: *Water pollution detection.

The report reviews the water pollution legislation adopted by a number of states in 1949. The report also reviews analytical methods used in water pollution detection.

PB-215 243
Federal Water Pollution Control Administration, Metuchen, N.J. Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project.
REPORT ON THE IMMEDIATE WATER POLLUTION CONTROL NEEDS FOR THE INTERSTATE AND INTRASTATE WATERS OF THE ST. LAWRENCE REGION.

Jun 67, 90p

Descriptors: (*Lake Champlain, *Water pollution), (*New York, Water pollution), (*Vermont, Water pollution), Saint Lawrence River.

The report reviews the water pollution problems in the St. Lawrence Region, which is defined to include all streams draining to the St. Lawrence River from the St. Regis River in New York on the west to Lake Memphremagog in Vermont on the east. The major drainage basin within the Region is that of Lake Champlain. The discharge of waste from municipalities, industries, and numerous other sources degrades water quality and prevents full utilization of the natural resources throughout the Region. The purpose of the report is to delineate those actions which should be undertaken immediately to prevent further degradation and to provide enhancement of these waters. These actions include not only construction of new or improved municipal and industrial waste treatment facilities, but also studies, surveys and research which are needed to develop sound water quality management programs for the future. (Author)

PB-215 244
Sanitary Engineering Center, Cincinnati, Ohio.

CONFERENCE ON SHELLFISH TOXICOLOGY, 1957.
1957, 129p

Descriptors: (*Shellfish, *Toxicology), (*Seafood, *Food poisoning), (*Food sanitation, Shellfish), Poisons, Fisheries, Bioassay, Standards, Permissable dosage, Food consumption, Clams, Alaska, Canada, United States, Proceedings.

The prevention of outbreaks of paralytic shellfish poisoning has been a problem of mutual concern to health and fishery agencies in Canada and the United States for many years. The objectives of the conference reported in these proceedings were: Evaluate progress made since 1955 in development of a standard bioassay procedure; review the maximum concentration of poison which should be permitted in market shellfish and consider development of a program to allow utilization of Alaskan clam resources.

PB-215 245
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ELECTROCHEMICAL TREATMENT OF MUNICIPAL WASTE WATER.
Final rept.,
H. C. Miller, and W. Knipe. 1 Oct 63, 113p
Prepared in cooperation with Pennsalt Chemicals Corporation, Research and Development Department. See also report dated March 65, PB-168 794.

Descriptors: (*Sewage treatment, *Electrolysis).

Although electrolytic methods of treating waste water are reported in the older literature, their effectiveness is in doubt. This study has shown that an electrolytic treatment of secondary effluent from an activated sludge plant using lead dioxide anodes can reduce ABS by 90%, COD by 80%, and chloride by 90%. This treatment has little effect on total solids. The cost of treatment will vary between $.90 and $2.42 per 1000 gallons. The plant costs will vary between 9 and 26 million dollars for a 10 mgd plant. These costs do not include site preparation, roads, landscaping, fences, land area, lighting, laboratories, or other buildings, and the costs depend on the completeness of the treatment and the electrical conductivity of the waste water. (Author)

PB-215 246
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
REPORT ON THE WASTE TREATMENT AND DISPOSAL OPERATION AT THE 100 AND 300 AREAS, HANFORD PROJECT, RICHLAND, WASHINGTON.
Nov 69, 28p

Descriptors: (*Nuclear reactors, Water pollution), (*Water pollution, *Radioactive contaminants), Washington (State).
Identifiers: *Hanford (Washington), *Water pollution control.

The report describes the findings resulting from a review and examination of water pollution possibilities created by activities of a nuclear reactor facility.

PB-215 247
Public Health Service, Cincinnati, Ohio.
THE OHIO RIVER POLLUTION SURVEY, METHODS AND PROGRESS,
H. W. Streeter, and E. S. Tisdale. 1939, 22p
Presented at the Ohio Conference on Sewage Treatment (13th), Toledo, Ohio. 5 Oct 39.

Descriptors: (*Water pollution, *Ohio River), (*Ohio, Water pollution), (*Kentucky, Water pollution).

The report describes an extensive 1939 survey of water pollution and sources of pollution in the Ohio River and its tributaries.

PB-215 254/4
Pacific Northwest Water Lab., Corvallis, Oreg.
QUARTERLY PROGRESS REPORT. JANUARY 1-MARCH 1, 1971.
Apr 71, 52p

Descriptors: (*Water pollution, Research), Limnology, Industrial waste treatment, Heat, Food processing, Coasts.
Identifiers: Thermal pollution, Eutrophication.

Presented are the accomplishments of the Pacific Northwest Water Laboratory in the first quarter of 1971. The areas of research covered include: Eutrophication; Waste treatment; Thermal pollution; Coastal pollution; Consolidated laboratory services program; and Training and manpower development.

PB-215 281
Stanford Univ., Calif. Dept. of Civil Engineering.
ION EFFECTS IN 'ANAEROBIC DIGESTION'.
Technical rept.,
Perry L. McCarty, Irwin J. Kugelman, and Alonzo William Lawrence. Mar 64, 160p TR-33
Grant PHS-WP-482

Descriptors: (*Anaerobic processes, Poisons), (*Sewage treatment, *Microorganism control (Sewage)), Sludge digestion, Metals, pH, Inorganic sulfides.

The report presents results of research on the effects of organic and inorganic ions on the anaerobic waste treatment process. Studied were the effects of various cations, the toxicity of various heavy metals, and the effect of high concentrations of individual volatile acids on the anaerobic treatment process.

PB-215 282/5
Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Management Office.
RESIDENTIAL SOLID WASTE GENERATED IN LOW-INCOME AREAS,
Samuel Hale, Jr. 1972, 17p EPA-SW-83TS

Descriptors: (*Waste disposal, *Socioeconomic status), (*Urban areas, Waste disposal), Distribution (Property), Characteristics, Trends, Residential buildings.
Identifiers: *Economically depressed areas, Disadvantaged groups, Low income groups, *Poverty areas, *Solid waste disposal.

Variations inherent in the generation of solid wastes make it extremely difficult to predict quantities that can be expected from a dwelling within a residential neighborhood. Some possibly influencing factors are climate, season, socioeconomic level, and dweller density. The objective of the study was to examine the quantities and critical factors involved in the generation of solid wastes in low-income residential neighborhoods. The results are presented in order that a better understanding of waste quantities and characteristics may be obtained. (Author)

PB-215 283
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
TIME-TEMPERATURE EFFECTS ON SALMONELLEA AND STAPHYLOCOCCI IN FOODS. I. BEHAVIOR IN BROTH CULTURES AND REFRIGERATED FOODS,
Robert Angelotti, Elizabeth Wilson, Milton J. Foter, and Keith H. Lewis. 1959, 60p SEC-TR-F59-2

Descriptors: (*Food processing, *Food poisoning), (*Salmonella, *Food contamination), (*Staphylococcus, *Food contamination), Temperature, Growth, Food processing, Food deterioration.

Staphylococci and salmonellae are the principal causes of illness currently encountered in perishable foods. Time-temperature data comparable to those available for the pasteurization of milk or for canning, which define conditions of refrigeration, cooking, or warm holding of perishable foods, have not been established for these organisms. These studies were undertaken to make available an organized body of technical data on the critical time-temperature values for salmonellae and staphylococci under these conditions. (Author)

PB-215 284
Utah Water Research Lab., Logan.
WATER QUALITY TELEMETRY.
Annual progress rept. no. 1,
Duard S. Woffinden, and Allen D. Kartchner. Aug 68, 44p PRWG-53-1
Grant WPD-179-01-67

Descriptors: (*Remote sensing, *Water quality), (*Monitors, Water quality), (*Radio telemetry, Water quality).

The primary objective of the project is to demonstrate the feasibility of telemetering, by radio transmission, several water quality parameters from remote, battery operated, monitoring stations to a central receiving station. A secondary objective of the project is to show the economic feasibility of establishing and maintaining a remote, battery-operated field station.

PB-215 285
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SYNTHETIC DETERGENTS AND THEIR EFFECTS ON SEWAGE TREATMENT AND WATER POLLUTION. A REVIEW OF THE LITERATURE,
Russell S. Smith, Graham Walton, and Jesse M. Cohen. Jun 54, 41p

Descriptors: (*Water pollution, *Detergents), (*Sewage treatment, *Detergents).

The report discusses attempts to alleviate existing confusion resulting from board or all inclusive usage of terms previously used in literature relative to the effects of detergents in water and sewage treatment plants.

PB-215 286
Environmental Health Center, Cincinnati, Ohio.
A STUDY OF THE SOURCE OF WATER SUPPLY FOR THE CITYI OF DULUTH, MINNESOTA, WITH SPECIAL REGARD TO THE TREATMENT PROVIDED,
Albert H. Stevenson. 1949, 28p

Descriptors: (*Water supply, *Minnesota).
Identifiers: *Duluth (Minnesota).

The study has been confined to a review of the adequacy of the waterworks facilities, water treatment operations and control including potential hazards which could be expected to affect the quality of the delivered water at the Lakewood plant. The report includes a discussion and conclusions as to the adequacy of present treatment methods, and recommendations for additional facilities and controls.

PB-215 287
Utah Univ., Salt Lake City. Dept. of Zoology and Entomology.
TASTE AND ODOR PRODUCTION BY BLUE-GREEN ALGAE IN RESERVOIRS.
Progress rept. 1 Jun 62-30 Sep 64,
Arden R. Gaufin. 28 Oct 64, 25p
Grant FWPCA-WP-334

Descriptors: (*Water pollution, Algae), (*Algae, *Limnology), (*Cyanophyta, Limnology), (*Water pollution, *Odors), (*Reservoirs, Algae), Taste, Water supply, Lakes, Streams, Phytoplankton, Aquatic plants, Plant physiology, Water chemistry.

Microorganisms in water that have been incriminated in taste and odor production include the protozoa, bacteria, actinomycetes, molds, and algae. The last group is particularly important in water supplies. The degree to which a body of water can support a dense 'bloom' of an alga and becomes highly odoriferous depends on the specific environmental requirements of the alga, including its nutritional needs. In their growth, algae utilize the mineral nutrients that have come from the land as well as carbon dioxide from the air or that released in the decay of organic matter. The report presents results of a study concerned with studying the relationships between algae and nutrients.

PB-215 288
Federal Water Pollution Control Administration, Washington, D.C. Office of Estuarine Studies.
NATIONAL ESTUARINE INVENTORY. HANDBOOK OF DESCRIPTORS,
T. A. Wastler, and L. C. deGuerrero. Jun 68, 107p

Descriptors: (*Estuaries, *Data aquisition), Forms (Paper).

As part of the National Estuarine Pollution Study it is essential to describe the national estuarine system in terms of those parameters which are necessary to: identify quantitatively the present and potential uses of the estuarine resource; identify the present extent of pollution damage to beneficial uses of esturine zones; and make possible quantitative summaries and comparisons among the individual estuarine components of the national system. This inventory should provide a foundation for a continuing national estuarine inventory. (Author)

PB-215 289/0
Georgia Inst. of Tech., Atlanta.
SOLID WASTE CHARACTERISTICS AT THE ATLANTA STATE FARMERS' MARKET.
1971, 29p EPA-SW-3TG

Descriptors: (*Industrial wastes, *Waste disposal), Characteristics, Inventories, Seasonal variations, Moisture content, Density (Mass/Volume), Calorific value.
Identifiers: *Solid waste disposal.

The study provided an opportunity to apply existing methods for characterizing and analyzing solid wastes generated from a commercial activity. The Atlanta State Farmers' Market was chosen because of its convenience for survey and because it provided its own collection service which simplified sample analysis and data acquisition. Samples were collected and analyzed during the winter and summer quarters of 1969 or a once-weekly basis. (Author)

PB-215 290
Rensselaer Polytechnic Inst., Troy, N.Y.
KINETICS OF EXTENDED AERATION,
Donald R. Washington. Apr 64, 17p
Presented at Southern Municipal and Industrial Waste Conference (13th) at Duke Univ., Durham, N. C. on 16-17 April 1964.

Descriptors: (*Activated sludge process, Reaction kinetics), (*Sewage treatment, Activated sludge process).

The report describes the activated sludge process for treating small waste discharges and presents the kinetic theory of the extended aeration actived sludge process.

PB-215 291/6
Environmental Protection Agency, Athens, Ga. Surveillance and Analysis Div.
A REPORT ON BACTERIAL POLLUTION AFFECTING SHELLFISH HARVESTING IN NEWPORT RIVER, NORTH CAROLINA.
Apr 72, 64p

Descriptors: (*Newport River, *Bacteria), (*Water pollution, Newport River), (*North Carolina, Water pollution), Shellfish, Fisheries, Food contamination, Coliform bacteria, Sewage, Streptococcus, Concentration (Composition).
Identifiers: Sewage treatment effluent, Carteret County (North Carolina), *Water quality data.

A joint study is described which was conducted to determine the sources of bacterial pollution in freshwater and estuarine portions of the Newport River in Carteret County, North Carolina near Moorehead City. The Newport River is an important shellfish producing area, some of which has been closed to shellfish harvesting since October 1969. The report is concerned with the levels of bacterial indicators in the Newport River estuary and tributaries and, where possible, identification of the probable sources of the indicators. Conclusions are drawn and recommendations presented as to means of controlling bacterial contamination in the Newport estuary.

PB-215 292
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SAMPLE TYPE VII (WATER-OXYGEN DEMAND).

Jul 60, 39p
Report of the Analytical Reference Service Training Program.

Descriptors: (*Water analysis, *Biochemical oxygen demand), (*Water pollution, Biochemical oxygen demand).
Identifiers: *Water pollution detection.

Biochemical oxygen demand has been used for many years as a parameter in the study of water pollution. It is useful in the design and operation of waste treatment facilities, in the evaluation of the effects of wastes on streams, and in the determination of water quality. In the past, many authorities have considered it the most important single parameter available. This particular study was undertaken to fill gaps in the available information on the precision and accuracy of the oxygen demand determinations. Through simultaneous analysis of an identical sample, it is hoped that the common variables of the methods can be evaluated.

PB-215 293
Stanford Univ., Calif. Water Quality Control Lab.
WATER RECLAMATION STUDY PROGRAM.
Progress rept. 16 Aug 66-15 Sep 67,
George Tchobanoglous, Rolf Eliassen, and George E. Bennett. Oct 67, 59p
Grant WPD-21-05
See also report dated Aug 66, PB-215 325.

Descriptors: (*Water reclamation, Sewage treatment), (*Sewage treatment, *Ion exchanging), (*Sand filtration, Sewage treatment), Activated sludge process.

The overal objective of the demonstration plant operation is to investigate and define the potential benefits, particular advantages and disadvantages, and general applicability of the ion exchange and sand filtration processes for reclamation of treated wastewater. The current period of operation has been devoted to the optimization of the cost of existing processes. Two of the problems studies were the design and operation of filters for more effective utilization of the ion-exchange process and the development of satisfactory resin restoration techniques for minimizing the operating costs of the ion-exchange process. (Author)

PB-215 294
Environmental Health Center, Cincinnati, Ohio.
RESEARCH ON INDUSTRIAL WASTES AS RELATED TO WATER QUALITY,
C. C. Ruchhoft. Feb 53, 27p

Descriptors: (*Water pollution, *Taste), (*Odors, Water pollution), Industrial wastes.

It is the purpose of this paper to discuss industrial waste and water quality research that is needed to clarify the objectives for stream pollution abatement for the purpose of obtaining better water quality for domestic and industrial use. It is axiomatic that a bad tasting or smelling water is water of poor quality and is not conductive to public health, even though it is bacteriologically safe. The report discusses progress in the reduction of taste and odor producing constituents in surface water.

PB-215 295
National Sanitation Foundation, Ann Arbor, Mich.
PACKAGE PLANT CRITERIA DEVELOPMENT. PART I: EXTENDED AERATION.
Sep 66, 57p

Descriptors: (*Packaged sewage plants, Standards), Design criteria.
Identifiers: *Sewage treatment plants.

The report summarizes the research which was conducted to establish a means by which the performance of extended aeration package sewage treatment plants could be evaluated. The research effort resulted in the development of The Standard Performance Evaluation Method which is presented. The evaluation method is based on the Performance Criteria which are also presented.

PB-215 296
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
A FULL-SCALE EVALUATION OF LUXURY UPTAKE FOR PHOSPHORUS REMOVAL,
M. C. Mulbarger, D. G. Shifflett, M. C. Murphy, and D. D. Huffman. Feb 70, 29p

Descriptors: (*Activated sludge process, Phosphorus), (*Chemical removal (Sewage treatment), *Phosphorus), (*Sewage treatment, Phosphorus), Aerobic processes, Anaerobic processes, Clarification, Sludge digestion, Absorption (Biology), Performance evaluation, Cost estimates, Capitalized costs, Operating costs.
Identifiers: *Water pollution control.

A 1.0 mgd wastewater treatment plant, designed for biological phosphorus removal within an activated sludge system, was evaluated over a variety of operating conditions during its first year of operation. A maximum phosphorus removal rate 0.026 pounds of phosphorus removed per pound of COD removed was measured at one particular cell residence time. High influent phosphorus concentrations, however, reduce the plant's probable performance to less than 50 percent phosphorus removal at optimum conditions. Phosphorus removal apparently occurs through a combination of metabolic and physical-chemical mechanisms. The specialized plant design has caused several severe operating problems and capital and operating expenditures are significantly greater than reported for conventional activated sludge treatment. (Author)

PB-215 297
Environmental Health Center, Cincinnati, Ohio.
COMBINED TREATMENT OF DOMESTIC AND INDUSTRIAL WASTES,
Hayse H. Black. 1953, 11p
Presented at Annual Meeting of Illinois Association of Sanitary Districts, Bloomington, Illinois, September 2, 1953.

Descriptors: (*Industrial wastes, *Sewage treatment).

There are numerous types and combinations of industrial wastes currently being successfully treated in municipal sewage treatment plants. There is reason to believe that this practice will be continued and expanded. Combined treatment should prove economically sound and industry will be more inclined to reduce process wastes when

required to pay service charges. The progressive industrialist recognizes the expense of waste treatment as a legitimate cost of production. (Author)

PB-215 298
Federal Water Pollution Control Administration, Philadelphia, Pa. Delaware Estuary Comprehensive Study.
FEDERAL AND GOVERNMENT-SPONSORED AGENCIES IN THE WATER RESOURCES FIELD: AREAS OF INTEREST AND INFORMATION SERVICES,
D. A. Townson. Feb 69, 55p CWA-10-1

Descriptors: (*National government, *Water resources).
Identifiers: *Government agencies.

The purpose of the report is to provide information on the various Federal agencies that have an interest in the field of water resources. It is intended primarily as an information retrieval tool for use by the personnel of these agencies.

PB-215 299
Tennessee Valley Authority, Chattanooga. Div. of Health and Safety.
COMPOSTING DEVELOPMENTS IN THE UNITED STATES,
O. W. Kochtitzky, and John S. Wiley. 1965, 16p
Presented at the Region IV Vector Control Conference, Biloxie, Miss., 3 Jun 65.

Descriptors: (*Waste disposal, *Composts).
Identifiers: *Solid waste disposal.

The report describes the operations of selected municipal refuse composting plants and delineates the marketing problems encountered for the finished products.

PB-215 300
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SPECTROPHOTOMETRIC DETERMINATION OF CROTONALDEHYDE.

1960, 17p

Descriptors: (*Crotonaldehyde, *Spectroscopic analysis), (*Gas analysis, Crotonaldehyde), Aldehydes.
Identifiers: *Air pollution detection.

A spectrophotometric method has been developed for the analysis of crotonaldehyde based on its reaction with 4-hexylresorcinol. The product formed has two analytically useful absorption maxima at 385 and 345 micrometers. The crotonaldehyde product obeys Beer's law in the 1 to 20 microgram ml range. Saturated aldehydes and ketones, alcohols, esters, acids, most hydrocarbons and phenols do not interfere significantly. Unsaturated aldehydes, unsaturated ketone and diolefins in excess interfere appreciably, as does nitrogen dioxide. Results of the analyses of a number of liquid mixtures are given. (Author)

PB-215 302
Pittsburgh Coke and Chemical Co., Pa. Research and Development Div.
A NON-SELECTIVE COLLECTOR FOR SAMPLING GASEOUS AIR POLLUTANTS.
Final technical rept.,
Stanton B. Smith, and Richard J. Grant. 1959, 69p
SEC-TR-A59-3
Contract SAph-68345

Descriptors: (*Gas sampling, *Air pollution), (*Activated carbon, Gas sampling).

In selective tests for individual air pollutants, the bulk of organic vapors cannot be specifically determined by purely chemical means; fractionation methods such as vapor-phase chromatography must be used which demand a non-selective method of sampling. Adsorption has been used for this purpose, but has never been critically evaluated. For this purpose, a contract was initiated for the design and evaluation of a portable adsorption sampler.

PB-215 303
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
COLORADO RIVER BASIN WATER QUALITY CONTROL PROJECT. A STUDY OF COLORADO RIVER WATER QUALITY NEAR YUMA, ARIZONA.
Jun 61, 15p

Descriptors: (*Water pollution, *Colorado River Basin), (*Arizona, Water pollution).
Identifiers: *Water quality data, *Yuma (Arizona).

This is a report of a short field study conducted by the Colorado River Basin Water Quality Control Project of the Public Health Service in the Yuma, Arizona area during March, 1961.

PB-215 304
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE ROLE OF THE UNITED STATES PUBLIC HEALTH SERVICE IN AIR POLLUTION,
Arthur C. Stern. 1955, 12p
For presentation at the 1955 Annual Meeting of the Air Pollution Control Association in Detroit, Michigan, May 23, 1955.

Descriptors: (*Public health, *Air pollution), Sanitary engineering, Abatement, Sampling, Mortality, Morbidity, Diseases, Projects, Organizations.
Identifiers: *United States Public Health Service, Government agencies.

The organization of the Public Health Service is described, with particular reference to those parts of the Service most concerned with air pollution. These are, specifically, the Public Health Service Regional Organization, the Division of Special Health Services, and the Division of Sanitary Engineering Services. The responsibility of the latter division in this field is discussed in detail. This responsibility is primarily assigned to the Air Pollution Control Program at the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio.

PB-215 305
National Air Pollution Control Administration, Arlington, Va. Div. of Air Quality and Emission Data.
CONTINUOUS AIR MONITORING PROJECTS: NATIONAL AIR SURVEILLANCE NETWORKS. 1967 DATA TABULATIONS AND SUMMARIES, CHICAGO.

Apr 69, 98p APTD-69-6

Descriptors: (*Illinois, *Air pollution).
Identifiers: *Chicago (Illinois), *Air quality data, *Continuous Air Monitoring Projects.

One of the Continuous Air Monitoring Projects of the National Air Surveillance Networks is to routinely operate continuous monitoring stations in six major cities. The data tabulations in this report consist of hourly average concentrations of six gaseous pollutants (carbon monoxide, nitric oxide, nitrogen dioxide, sulfur dioxide, total hydro-carbons, and total oxidants), and 2-hour measurements of soiling index levels in Chicago during 1967. A brief summary of monthly means and macimums and graphs of seasonal diurnal patterns of gaseous pollutants at the Chicago station are included. Annual frequency distributions of the data pertaining to gases and soiling index are presented for all six CAMP stations.

PB-215 306
Sanitary Engineering Center, Cincinnati, Ohio.
RECOMMENDED UNITS OF EXPRESSION FOR AIR POLLUTION,
Frank P. Terraglio, James P. Sheehy, and Raymond M. Manganelli. 1957, 11p
Presented at the Air Sanitation Technical Conference Mid-Atlantic States Section of the Air Pollution Control Association (6th), November 20, 1957, New York City.

Descriptors: (*Air pollution, *Metrology).

A system of units of commonly measured parameters in the field of air pollution is presented. Many of the units currently in use are listed together with the recommended unit to be used. An attempt was made to reduce the number of units of expression to one for each of the parameters. Also units were selected that would give small whole numbers for ease of handling and discussion. It will be noted that all values are expressed in the metric system. (Author)

PB-215 307
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
BEET SUGAR WASTE TREATMENT BY BROAD FIELD APPLICATION-GREAT WESTERN SUGAR COMPANY, BAYARD, NEBRASKA.
Rept. for Oct-Dec 53.
Apr 54, 57p
Prepared in cooperation with the Wyoming Department of Public Health and the Nebraska Department of Health.

Descriptors: (*Industrial waste treatment, *Food processing).
Identifiers: *Sugar beet processing.

An evaluation is made of the method employed by the Great Western Sugar Company at its Bayard, Nebraska, plant to treat straight house beet sugar wastes by application of a natural grassland field. (Author)

PB-215 308
Environmental Health CENTER, Cincinnati, Ohio.
OKLAHOMA CITY TASTE AND ODOR STUDY. A PRELIMINARY STUDY OF THE TASTE AND ODOR PROBLEMS IN THE OKLAHOMA CITY WATER SUPPLY,
Clarence M. Tarzwell. Jun 50, 41p

Descriptors: (*Water supply, *Oklahoma), (*Water pollution, Oklahoma), (*Taste, Water supply).
Identifiers: *Oklahoma City (Oklahoma).

During September, October and November, 1949, the Water Department of Oklahoma City has a very serious taste and odor problem in one of their two storage reservoirs, Lake Hefner. Because these problems have arisen in the new storage reservoir, Hefner, and all water supplies are obtained from the North Canadian River, the Oklahoma City officials are apprehensive of the possible effects of the recently completed Canton Reservoir on their water supply. The purpose of this investigation was to study ecological conditions in Canton Reservoir and to examine the situation at Oklahoma City in order that the problem could be more adequately defined. The Oklahoma City water supply reservoirs and plants were examined and data collected on their physical characteristics, their mode of operation, the chemical content of the water, turbidities and their general ecology.

PB-215 309
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
SWEET HOME, OREGON. PRELIMINARY ESTIMATE OF ECONOMIC GROWTH, 1960--2010.

22 Aug 62, 10p Working Paper-29

Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Oregon, Economic development), (*Columbia River basin, Economic development), River basin development.
Identifiers: *Sweet Home (Oregon).

The analysis is intended to provide a preliminary estimate of the economic potentials and a broad guide to the anticipated growth of the subject area. It is intended only as an initial estimate of the outlook for Sweet Home, and its conclusions are for design purposes only. Subsequently, in connection with the Columbia Basin Study, an analysis will be made, on an industry-by-industry basis, of the growth potential of the central Willamette Basin.

PB-215 310
Environmental Health Center, Oak Ridge, Tenn.
REMOVAL OF RADIOISOTOPES FROM WASTE SOLUTIONS SOIL SUSPENSION STUDIES,
Conrad P. Straub, and Herman L. Krieger. 1953, 36p
Presented at the Industrial Waste Conference (8th), Purdue Univ., Lafayette, Ind., 6 May 53.

Descriptors: (*Radioactive isotopes, *Adsorption), Ion exchanging, Clays.

The study was undertaken to determine the effect of clay concentrations, nature and source of the clay, pH, substrate, and added carrier on the removal of individual radioisotopes.

PB-215 311
Environmental Health Center, Cincinnati, Ohio.
A REPORT ON THE OCCURRENCE OF EXCESSIVE FOAM AT THE WHEELING, WEST VIRGINIA WATER PURIFICATION PLANT,
F. M. Middleton. Feb 54, 6p

Descriptors: (*Water pollution, *Detergents), (*Water treatment, Detergents).
Identifiers: *Wheeling (West Virginia).

The incident of the foam at Wheeling, West Virginia and the subsequent findings strongly point to the need for additional research on the effects of detergents on streams used as a source for water supplies. More suitable analytical methods need to be developed. Methods for treating waters containing these materials at the water plant have not been sufficiently studied. Great variability may exist in the persistence in water of detergent material and the allied compounding agents used in commercial formulations. Disruption of normal water treatment processes by such materials is cause for concern. (Author)

PB-215 312
Public Health Service, Cincinnati, Ohio. Ohio-Tennessee Drainage Basins Office.
SELECTED BIOLOGICAL REFERENCES APPLICABLE TO WATER TREATMENT,
William Marcus Ingram. Oct 52, 38p

Descriptors: (*Sewage treatment, *Aquatic microbiology), (*Bibliographies, Sewage treatment), (*Water treatment, *Aquatic microbiology).

The references are organized into bibliographies that will refer the reader to organism problems that have been associated with specific steps in the water treatment process. The bibliographies are: general references; taste and odor control and associated organisms; flowering aquatic plant control; the effect of algae and weed control agents on fish; some biological aspects of impounding reservoirs; screen clogging organisms; filter clogging organisms; effect of chlorine on organisms; clear well organisms; pipe associated organisms; esthetic quality and organisms; water softening by algae; microorganism counting methods; identification of organisms; toxic algae; actinomycetes, and plankton record sheet.

PB-215 313
Public Health Service, Washington, D. C. Div. of Air Pollution.
A PILOT STUDY OF AIR POLLUTION IN WASHINGTON, D. C., DECEMBER 2-8, 1960,
Frank A. Bell, Jr., William J. Beck, James H. Shimp, and Gene B. Welsh. 1960, 19p
Prepared in cooperation with the District of Columbia Dept. of Public Health.

Descriptors: (*District of Columbia, *Air pollution).
Identifiers: *Air quality data.

The report presents the results of intensive air pollution sampling covering seven days, including one weekend, and one all-night sampling period. The period covered was December 2 through December 8, 1960, from 9:00 AM, to 5:00 PM. The all-night sampling period covered 9:00 AM, December 5 through 9:00 AM, December 6. The gas and particulate pollutants under test were selected to be indicative of the general air pollution of the area. Visibility measurements to ground level objects were taken every hour. The roof of the seven-story District of Columbia Municipal Center Building, 300 Indiana Avenue, N. W., was selected as the sampling site. (Author)

PB-215 314
Environmental Health Center, Cincinnati, Ohio.
ANNUAL REVIEW OF LITERATURE (1950) ON: I. STREAM POLLUTION, II. ANALYTICAL METHODS, III. RADIOACTIVE WASTES,
M. B. Ettinger, W. Allan Moore, and L. R. Setter. Mar 51, 97p

Descriptors: (*Water pollution, Reviews), (*Water analysis, Reviews), (*Radioactive contaminants, Water pollution).

The report contains a review of literature on stream pollution including abatement and control, bacteriology, biology, chemistry, oxygen sag and self purification, and stream surveys and studies. Also included are reviews of literature on analytical methods and radioactive wastes.

PB-215 315
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY CONTROL AND MANAGEMENT, SNAKE RIVER BASIN.
Sep 68, 75p

Descriptors: (*Water pollution, *Snake River), (*Washington (State), Water pollution), (*Idaho, Water pollution), (*Wyoming, Water pollution), (*Utah, Water pollution), (*Nevada, Water pollution), (*Oregon, Water pollution).

The thrust of this report is better and more comprehensive management to accommodate changing and multiple uses of the Snake River water resources. The report summarizes the findings of studies which have provided the inpetus to Federal-State water pollution control planning in the Snake Basin since 1962. It tells where pollution exists and why it exists. It tells what corrective action has already been initiated. It tells what further steps must be taken to preserve and enhance the quality of water resources of the basin. And it serves as a blueprint from which to build future programs for the water quality essential to the many uses and enjoyment of water in the Snake Basin.

PB-215 316
Public Health Service, Cincinnati, Ohio.
RECENT AIR POLLUTION CONTROL DEVELOPMENTS -- A REVIEW OF PUBLISHED INFORMATION.
Bibliography for period Aug 58-Jul 60, David G. Stephan. Oct 60, 38p

Descriptors: (*Air pollution, *Reviews), Bibliographies.
Identifiers: *Air pollution control.

A concise review and bibliography is presented of information published on air pollution control during the two-year period ending July 1960. A total of 336 articles on air pollution control were evaluated. Most could be categorized as (1) a report of research, (2) a description of a specific control installation, (3) a discussion of control for a particular industry or for a given process, (4) a description of control equipment, or (5) a discussion of a class of control devices or techniques. The few remaining papers were across-the-board discussions of pollution problems or of control devices in general. Articles describing research results and those of a general nature are reviewed. Articles describing research results and those of a general nature are reviewed. These and the remaining references are included in a subject index keyed to a complete bibliography.

PB-215 317
Environmental Health Center, Cincinnati, Ohio.
A RATIONAL DESIGN OF SEWAGE ARSORPTION FIELDS. (DISCUSSION OF THE PAPER BY JOHN E. KIKER, JR.),
T. W. Bendixen. 20 Jan 50, 7p
Report for presentation before the Annual Meeting of the New York State Sewage Works Association at New York City, January 20, 1950.

Descriptors: (*Sewage disposal, *Percolation).

The author examines the 'Relation Between Percolation Test and Allowable Loadings' given by Professor Kiker,. The author recalculates the percolation rates from units of minutes per inch of fall to gallons per square foot per day in order that the percolation rates and the allowable sewage loading rates may be compared directly. There appears to be a remarkable reduction in the allowable sewage loading rates compared to the measured percolation rates.

PB-215 318
Environmental Health Center, Cincinnati, Ohio.
ANNUAL REVIEW OF LITERATURE (1952) ON WATER POLLUTION,
C. C. Ruchhoft, M. B. Ettinger, Donald D. Gold, P. W. Kabler, and Max Katz. Feb 53, 104p

Descriptors: (*Water pollution, *Reviews).

The areas covered by the review are: Abatement and control; Bacteriology; Biology; Chemistry; B.O.D. and oxygen slag; Stream standards; and Stream surveys and studies.

PB-215 319
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A REVIEW OF THE AIR POLLUTION SITUATION IN THE SALT LAKE VALLEY, UTAH,
Donald M. Keagy, and Jack M. Leavitt. Aug 59, 34p

Descriptors: (*Utah, *Air pollution), (*Salt Lake Valley, Air pollution).
Identifiers: *Salt Lake City (Utah).

Much consideration has been given to studies of the air pollution situation in the Salt Lake Valley. A one-week review, made in October 1958 is reported.

PB-215 320
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN LAS VEGAS INTERSTATE AIR QUALITY CONTROL REGION (NEVADA -

ARIZONA).

Jun 70, 11op APTD-1198

Descriptors: (*Air pollution, *Nevada).
Identifiers: *Las Vegas (Nevada), *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adaptation of air quality standards and plans for implementation of the standards. A study was thus conducted of Las Vegas, Nevada. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 321
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE EL PASO--LAS CRUCES--ALAMOGORDO INTERSTATE AIR QUALITY CONTROL REGION (TEXAS - NEW MEXICO).

Jul 70, 63p APTD-1213

Descriptors: (*Air pollution, *New Mexico), (*Air pollution, *Texas).
Identifiers: *Air quality data, *El Paso (Texas), *Las Cruces (New Mexico), *Alamogordo (New Mexico).

The Clean Air Act requres the designation of 'air quality control regions' prior to the adaptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the El Paso--Las Cruces--Alamogordo, New Mexico-Texas area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 322
Washington Univ., Seattle. Dept. of Civil Engineering.
THE NATURE OF ORGANIC COLOR IN WATER,
Russell F. Christman, and Masood Ghassemi. Jan 66, 51p
Grant FWPCA-WP-00558

Descriptors: (*Water pollution, *Colors (Materials)).

The organic materials responsible for color in water have been isolated from several natural streams and subjected to comparative chemical studies. Oxidation with alkaline-CuO was found to be an effective method of degrading the complex color molecule to recognizable chemical structures. Seven degradation products of natural organic color were identified; namely vanillin, vanillic acid, syringic acid, catechol, resorcinol, protocatechuic acid and 3,5-dihydroxy-benzoic acid. Evaluation of the effect of the oxidation technique on model compounds coupled with the knowledge of seven color degradation products resulted in the proposal of a structural formula for color producing molecules in water. (Author)

PB-215 323
Stanford Univ., Calif. Dept. of Civil Engineering.
RECLAMATION OF RE-USABLE WATER FROM SEWAGE.
Progress rept. 16 Jul 63-15 Jul 64,
Rolf Eliassen, and Bruce M. Wyckoff. Aug 64, 60p TR-41
Grant WPD-21-02-64

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Activated sludge process, Chemical removal (Sewage treatment)), (*Chemical removal (Sewage treatment), *Water reclamation).
Identifiers: Tertiary sewage treatment.

In laboratory studies, various processes were tried for further treatment of effluent from a laboratory scale activated sludge plant. Ion exchange has been utilized with different resins and in different configurations to remove nutrients, nitrogen and phosphorus, and also organic materials. A strong-base ion exchange resin, regenerated with chlorides, was the most successful. Phosphorus and color were removed by chemical coagulation using liquid alum and commercial ferric sulfate as coagulants. The effect of foam fractionation on ABS and COD removal and on the form of nitrogen was studied. In addition, nitrogen removal by a denitrification process was also studied. (Author)

PB-215 324
Minnesota State Dept. of Iron Range Resources and Rehabilitation, St. Paul.
PEAT BOG WASTE STABILIZATION.
Final rept. 1 Mar 67-28 Feb 69,
A. M. DeYoannes, and R. S. Farnham. Feb 69, 47p
Grants WPD-164-01 (RI)-67, WPD-164-02-68
Prepared in cooperation with Minnesota Univ., Dept. of Soil Science.

Descriptors: (*Peat deposits, *Waste disposal), (*Wood wastes, *Industrial waste treatment).
Identifiers: *Wood processing industry, *Liquid waste disposal.

The document studies the phenomenon by which waste water from a wood processing plant became stabilized after discharge onto an adjacent peat bog in Northern Minnesota. It was thought that peat might be ultimately used for on site water pollution abatement and an explanation of the mechanism involved should be determined. Both batch type experiments and continuous loading studies were conducted to study aerobic trickle-type filtration processes using natural peat as the filtering media to remove phosphates, calcium and reduce B.O.D. of effluents (both natural and synthetic) and the use of column and lysimeter studies of natural peat removed from bogs to study the mechanisms involved in absorbtion of elements in sewage and synthetic effluents and determine loading rates.

PB-215 325
Stanford Univ., Calif. Water Quality Control Lab.
WATER RECLAMATION STUDY PROGRAM. RECLAMATION OF REUSABLE WATER FROM SEWAGE.
Progress rept. 15 Sep 65-15 Aug 66,
George E. Bennett, Rolf Eliassen, and Perry L. McCarty. Aug 66, 45p
Grant WPD-21-04-66

Descriptors: (*Chemical removal (Sewage treatment), *Nutrients), (*Sewage treatment, *Ion exchanging), (*Water reclamation, Sewage treatment), Aactivated sludge process.

A demonstration plant for the removal of nutrients from activated sludge effluent has been operated by Stanford University. During the past eleven months, significant accomplishments have included the redesign of filtration and ion-exchange equipment and replacement of the original equipment with optimized units, successful plant-scale restoration of the ion-exchange resin (twice), increase of the filtration unit and ion-exchange flow rates, reductions in operating chemical costs, demonstration of the effects of non-nutrient anions in the water to be processed, evaluation of the influence of trace nutrient materials (i.e., materials other than phosphorous and nitrates) upon algal growth potential.

PB-215 326
Florida Univ., Gainesville.
TO DEMONSTRATE THE EFFECTIVENESS OF IODINE FOR THE DISINFECTION OF PUBLIC WATER SUPPLIES AND TO DETERMINE THE PHYSIOLOGICAL EFFECTS ON A HUMAN POPULATION.
Progress rept. no. 2,
A. P. Black. Nov 64, 52p
Grant WPD-19-02-64

Descriptors: (*Water treatment, Disinfection), (*Disinfection, *Iodination), Public health.

The report discusses the research involved in studying the effects to humans of using iodination for water disinfection.

PB-215 327
Environmental Health Center, Cincinnati, Ohio.
ANNUAL REVIEW OF LITERATURE (1952) ON RADIOACTIVITY PERTAINING TO RADIOACTIVE WASTES,
L. R. Setter. Feb 53, 25p

Descriptors: (*Radioactive contaminants, *Air pollution), (*Radioactive contaminants, *Water pollution), (*Reviews, *Radioactive wastes).

The report reviews the 1952 literature on radioactive wastes, its disposal, treatment, and storage. The report also reviews the literature on pollution by radioactivity.

PB-215 328/6
California Univ., Davis.
PROCEEDINGS: NATIONAL CONFERENCE ON PACKAGING WASTES. (1ST), 22-24 SEPTEMBER 1969.
1971, 241p EPA-SW-9RG
Grant PHS-EC-00324
Paper copy available from GPO $2.00 as stock no. 5502-0013.

Descriptors: (*Waste disposal, *Packaging materials), (*Meetings, Waste disposal), Management planning, Metals, Glass, Plastics, Abatement, Government policies.
Identifiers: *Solid waste disposal.

The First National Conference on Packaging Wastes was held September 22 through 24, 1969 in San Francisco. The conference was structured to promote meaningful dialogue among top-level officials in the entire packaging and user industries, waste disposal industry, government and universities, and also to attract participation of the public at large--all aimed at generating ideas for and approaches to the solution of packaging waste problems. The conference program focused attention especially on defining and clarifying the many problems related to the accumulation and disposal of packaging wastes. The conference did not result in many specific answers to packaging wastes problems: However it did formulate the proper questions in terms of approach and did identify individuals, industrial organizations, government agencies and universities with the capability of cooperatively developing the means for managing and controlling these packaging wastes. The reports presented at the meeting are given in full.

PB-215 329
Environmental Health Center, Cincinnati, Ohio.
BATHING WATER QUALITY AND HEALTH - II. INLAND RIVER,
Russell S. Smith, and T. D. Woolsey. 1952, 76p
See also PB-215 332.

Descriptors: (*Public health, Swimming), (*Ohio River, Water pollution), (*Water pollution, Swimming), (*Kentucky, Water pollution), Bacteriology, Epidemiology, Infections, Beaches, Environmental surveys.
Identifiers: Dayton (Kentucky), Bellevue (Kentucky).

A survey was made of bathing water that exceeded the water pollution limits allowed under the most liberal existing standards. If the study showed no significant increase in illness among bathers using such polluted water, then many of the existing standards might be considered unduly restrictive. The Ohio River in the vicinity of Cincinnati met the required conditions of such polluted water. A

survey of illness incidence in the Kentucky communities of Dayton and Bellevue adjacent to a beach off the Ohio River might yield valuable information. Thus an epidemiological survey, during the summer of 1949 is reported.

PB-215 330
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE VIRGIN ISLANDS AIR QUALITY CONTROL REGION.

Mar 70, 44p APTD-1193

Descriptors: (*Virgin Islands, *Air pollution).
Identifiers: *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adaptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the Virgin Islands area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 331
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE COMMONWEALTH OF PUERTO RICO AIR QUALITY CONTROL REGION.

May 70, 47p APTD-1194

Descriptors: (*Puerto Rico, *Air pollution).
Identifiers: *Air quality data.

The body of the report contains a proposal for the boundaries of the Commonwealth of Puerto Rico Air Quality Control Region and supporting studies on engineering and urban factors. The report itself is intended to serve as the background document for the formal consultation with appropriate State and local authorities.

PB-215 332
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BATHING WATER QUALITY AND HEALTH - III. COASTAL WATER,
L. J. McCabe, Jr. 1961, 145p SEC-TR-W61-51
See also PB-215 329.

Descriptors: (*Public health, Swimming), (*Water pollution, *Swimming), (*Long Island Sound, Water pollution), Epidemiology, Infections, Bacteriology, Environmental surveys, Beaches, Salt water, New York.

There are important variants in salt water that are not encountered by fresh water swimmers. Salt water has a bactericidal effect which causes a rapid diminution in the densities of coliform and other introduced bacteria. Because of salinity, there is also less inclination to take water into the mouth and therefore less likelihood of infection by enteric pathogens that might be present. The objectives of the present study were to: Determine the bacterial quality of coastal waters at the bathing areas; Investigate the physical factors which influence bathing water quality; Collect epidemiological data on diseases, minor illnesses, and irritations which might be attributable to bathing, and correlate them with water quality.

PB-215 333
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WATER QUALITY MANAGEMENT OF THE FUTURE,
Joseph E. Flanagan, Jr. 1960, 6p
Presented at the Annual Meeting of the New England Water Works Association, Montreal (Quebec) 18-21 Sep 60.

Descriptors: (*Water resources, Management planning).

Water quality management in its broader sense is discussed in terms of the future, for it appears to be more a concept than a practice. The development of it as a practice is a major need and a major challenge of the next decade. It embodies a set of procedures for keeping each segment of the surface water resource in the continuous dynamic balance necessary to meet the requirements of each significant use and next use. The report discusses the trends of future management.

PB-215 334
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE GREATER METROPOLITAN CLEVELAND INTRASTATE AIR QUALITY CONTROL REGION.
Feb 69, 46p APTD-1220

Descriptors: (*Air pollution, *Ohio).
Identifiers: *Cleveland (Ohio), *Air quality data.

The basic background information is presented for the consultation with state and local authorities prior to the designation of air quality control regions as stipulated in the Clean Air Act. Boundaries for the regions are proposed and the factors which are the basis for the proposed boundaries are discussed. Reports for consultation consider ten factors: geography; population and economic activity; their prospective growth; probable direction of physical growth; the emission inventory and the location of sources; air quality and pollution transport analysis; regional planning; air pollution control; and governmental jurisdictions. (Author)

PB-215 335
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION IN CHARLESTON, SOUTH CAROLINA.
Technical rept.,
Paul A. Kenline. 1960, 33p SEC-TR-A60-6

Descriptors: (*South Carolina, *Air pollution).
Identifiers: *Air quality data, *Charleston (South Carolina).

An appraisal of factors relating to air pollution in the Charleston area was made to determine the status of the air pollution situation, and the need for government activity in solving air pollution problems. The report is an analysis of information collected relating to sources of pollutants, dispersion of pollutants, indication of pollution levels, and the status of local activity in the air pollution field.

PB-215 336
Clemson Univ., S.C. Dept. of Textiles.
STATE OF THE ART OF TEXTILE WASTE TREATMENT.
Water pollution control research series,
John J. Porter. Feb 71, 356p EPA-WQO-12090-ECS-02/71
Paper copy available from GPO $2.50 as stock no. 5501-0090.

Descriptors: (*Textile industry, *Industrial waste treatment), (*Water pollution, *Industrial wastes).
Identifiers: *Water pollution control.

A study has been made of waste treatment methods and practices used in the Textile industry. Information was obtained from people working in the textile processing industry, designing waste treatment plants, and enforcing state and federal regulations on waters discharged to streams and natural reservoirs. To supplement this information the literature was reviewed and an annotated bibliography prepared using relevant articles. The report contains sections on the following: characteristics of textile waste, waste treatment techniques, treatment methods in use, effects of textile wastes on receiving waters, the cost of waste treatment operations, and state and federal regulations governing discharge waters. Areas of needed research are recommended to improve waste treatment methods currently practiced by the textile industry. The report is designed to give the reader an insight into the problems facing the textile industry, solutions presently available, and references for further reading. The annotated bibliography contains references on synthetic fiber manufacturing wastes, detergent waste treatment, instrumentation, plant design, water treatment for plant use as well as articles pertaining specifically to textile waste treatment. (Author)

PB-215 337
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RADIOACTIVE FALLOUT IN RAIN IN THE CINCINNATI AREA,
J. S. Nader, A. S. Goldin, and L. R. Setter. Sep 54, 17p

Descriptors: (*Radioactive contaminants, *Air pollution), (*Ohio, Radioactive contaminants), (*Fallout, Ohio).
Identifiers: *Precipitation washout, *Cincinnati (Ohio).

A study of the radioactivity of precipitation in the Cincinnati area was made for twelve months beginning March 1953. Seven samples of precipitation between March 3 and March 18 were tested to obtain the background level in rainfall. On March 19, two days after the first weapon test of the Spring Series, a sharp rise in the beta activity of rain occurred. The radioactivity of subsequent rains during the test period was usually of greater intensity and varied widely. Following the weapon tests the activity of the rain decreased to levels near that of background. All activity measured was far below the intensity considered to be hazardous. The more pertinent findings of the study are presented. (Author)

PB-215 338
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
CHEMICAL RESEARCH AT THE ROBERT A. TAFT SANITARY ENGINEERING CENTER,
M. B. Ettinger. 1956, 15p
Identifiers: *Robert A Taft Sanitary Engineering Center.

The Center as an outgrowth of a stream pollution investigations station established at Cincinnati in 1913, and by the Public Health Service, and carries on four research programs: Water supply and water pollution control, milk and food, air pollution, and radiological health.

PB-215 339
Minnesota Univ., St. Paul. Dept. of Biochemistry.
THE CHANNEL AERATION PROCESS AT GLENWOOD, MINNESOTA-A TWO YEAR STUDY,
H. O. Halvorson, Roar Irgens, and Henry Bauer. 1969, 30p
Prepared in cooperation with Southwest Missouri State Teachers Coll., Springfield, and the Minnesota State Board of Health, Minneapolis. Sponsored in part by the Water Pollution Control Administration, Washington, D. C.

Descriptors: (*Sewage treatment, *Lagoons (Ponds)), Channels (Waterways).
Identifiers: *Aeration ponds, Glenwood (Minnesota).

The report discusses a channel aeration demonstration plant. Glenwood, Minnesota was chosen as a site for a demonstration plant for the following reasons: It discharged its sewage effluent into a lake - (Lake Minnewaska) and this was the only

organized community discharging sewage effluent into this lake. The algae growth in the lake was becoming progressively worse each year, particularly in that portion of the lake nearest the inlet of the creek that carried the effluent from the sewage treatment plant. The community was concerned about the preservation of the lake and therefore were very receptive to try this new type of treatment.

PB-215 355
Pacific Northwest Water Lab., Corvallis, Oreg.
PACIFIC NORTHWEST WATER LABORATORY QUARTERLY REPORT.
Progress rept. 1 Jan-31 Mar 69.

Apr 69, 42p

Descriptors: (*Water pollution, Research).

Contents:
- National eutrophication research program;
- Waste treatment research and technology program;
- National thermal pollution research program;
- National coastal pollution research program;
- Biological effects research program;
- Training and manpower development;
- Consolidated laboratory services program;
- Technical assistance and investigations;
- Pollution surveillance.

PB-215 356
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE BUFFALO AIR QUALITY CONTROL REGION.
Feb 69, 42p APTD-1215

Descriptors: (*New York, *Air pollution).
Identifiers: *Buffalo (New York), *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standard. A study was thus conducted of the Buffalo, New York area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 360
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT ON OIL SPILLS AFFECTING THE MINNESOTA AND MISSISSIPPI RIVERS, WINTER OF 1962-63.

1963, 51p

Descriptors: (*Water pollution, Oils), (*Minnesota River, Water pollution).
Identifiers: *Oil pollution, *Oil spills.

Two separate oil spills occurred on the Minnesota River during the winter of 1962-63, one of petroleum oil and the second of soybean oil. During the spring ice breakup, these oils discharged to the Mississippi River at St. Paul, Minnesota, and dispersed into several off-channel lakes between St. Paul, Minnesota, and Alma, Wisconsin, and resulted in the death of several thousand wild ducks. Some of the remedial activities included removal of oil from the water surface, construction of floating booms to divert oil from off-channel waters, and assistance in rescue of immobilized ducks and other wildlife. The object of this report is to present highlights of events and results of activities and studies conducted during the cleanup.

PB-215 361
National Sanitation Foundation, Ann Arbor, Mich.
PACKAGE SEWAGE TREATMENT PLANTS CRITERIA DEVELOPMENT. PART II: CONTACT STABILIZATION,
Robert M. Brown, Charles A. Farish, and Andrew T. Dempster. Jun 68, 30p
Contract WPD-74

Descriptors: (*Sewage treatment, *Contacting), (*Packaged sewage plants, *Contactors), (*Activated sludge process, Contacting), Performance evaluation.

This report completes the study on package plants. The purpose of this phase of the study was to develop performance criteria for contact stabilization type package sewage treatment plants. It should be emphasized that the data which appears was collected during the period of criteria development and not under necessarily normal operating conditions. It was found that operation of these plants indicated that this process can satisfactorily remove the major portion of both suspended solids and the bio-chemical oxygen demand in domestic wastewater without the creation of an odor or noise nuisance in the surrounding area.

PB-215 362
North Carolina Univ., Chapel Hill. Dept. of Environmental Science and Engineering.
MICROBIOLOGY OF ANAEROBIC SLUDGE.
Progress rept. 1 Jun 66-1 Sep 68,
Robert A. Mah. 1 Nov 68, 27p

Descriptors: (*Anaerobic processes, *Aquatic microbiology), (*Sewage treatment, Anaerobic processes).
Identifiers: *Methane bacteria.

Studies on the microbiology of anaerobic sludge disclosed that non-methanogenic strictly anaerobic bacteria comprised one of the most numerous groups of organisms present. These previously unreported organisms are mainly un-named Bacteroides species. Euryoxic bacteria constitute only a minor fraction of the normal bacterial flora but can become predominant in very short time if fermentable carbohydrates are present. This finding emphasizes the necessity of using unenriched fermentations for studying the sludge digestion process. Work is in progress to determine the source of substrates and the organisms responsible for the generation of acetic acid (the main methane-producing substrate). (Author)

PB-215 363
Washington Univ., St. Louis, Mo. Environmental and Sanitary Engineering Div.
CHEMICAL OXIDATION OF ORGANIC CONTAMINANTS IN WATER SUPPLIES,
R. G. Spicher, and R. T. Skrinde. 1963, 42p
Grant PHS-WP-346
Presented at the Annual Conference of the American Water Works Association (83rd), Kansas City, Mo., 19-24 May 63.

Descriptors: (*Water treatment, *Dissolved organic matter), (*Chemical removal (Water treatment), *Oxidation), (*Oxidizers, *Potassium permanganate).

The purpose of the research was to investigate the chemical oxidation of organic refractories with potassium permanganate. Permanganate oxidation of various organic refractories was investigated in deionized water and in modified natural river water systems. Controlled amounts and types of organics were reacted with permanganate under controlled conditions of pH, temperature, time and concentrations. Carbon chloroform extracts (CCE) and carbon alcohol extracts (CAE) were the two major groupings of organic refractories investigated.

PB-215 364
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SPECTROPHOTOMETRIC DETERMINATION OF 4-AMINOAZOBENZENES, 4-AMINOSTILBENES, SCHIFF BASES, AND ANALOGOUS COMPOUNDS WITH 3-METHYL-2-BENZOTHIAZOLONE HYDRAZONE.
Eugene Sawicki, and Thomas R. Hauser. 1961, 15p

Descriptors: (*Amines, *Colorimetric analysis), (*Spectroscopic analysis, Amines), (*Carcinogens, Spectroscopic analysis).
Identifiers: *Stilbene/amino, *Benzothiazolinone/hydrazone-methyl, *Aniline/phenylazo.

3-Methyl-2-benzothiazolone hydrazone is shown to be a powerful and versatile electrophilic reagent which can be used for the spectral detection and determination of strongly nucleophilic molecules containing a carbon atom of high electron density. The determination of approximately 50 azo dyes and a smaller group of stilbene and Schiff base derivatives by a new procedure for these compounds is described. 4-Amino-, 4-alkylamino, and 4-dialkylamino derivatives of azobenzene can be readily analyzed. The determination of N,N-dialkyl-4-aminoazobenzene was thoroughly investigated. (Author)

PB-215 365
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
BOISE RIVER BASIN (IDAHO) PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.

24 May 62, 16p Working Paper-18
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Boise River Basin, *Economic development), (*Idaho, Economic development), River basin development.

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the subject area. Two limitations apply to this study. The first is that it is intended only as a preliminary estimate of the outlook for the subject area's growth. The second limitation is that this study is intended for use particularly in assessing future water needs. Emphasis has been placed on the analysis of those industries which make heavy demands upon the water resource.

PB-215 366
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER TEMPERATURE INFLUENCES, EFFECTS, AND CONTROL. PROCEEDINGS OF THE PACIFIC NORTHWEST SYMPOSIUM ON WATER POLLUTION RESEARCH (12TH) CONDUCTED BY U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, AT THE PACIFIC NORTHWEST WATER LABORATORY AT CORVALLIS, OREGON, NOVEMBER 7, 1963,
Edward F. Eldridge. Apr 67, 163p

Descriptors: (*Reservoirs, *Stratification), (*Water pollution, Heat), Water quality, Salmon, Fishes, Animal diseases, Water supply, Temperature measuring instruments, Umpqua River, Oregon, Columbia River, Proceedings.

Contents:
- Temperature as a water quality parameter;
- Effects of water uses and impoundments on water temperature;
- Water temperature requirements for maximum productivity of salmon;
- The effects of temperature on disease in fish;
- Temperature studies on the Umpqua River, Oregon;
- Temperature phenomena and control in reservoirs;
- Method of computing average reservoir temperature;

Some observations of Columbia River and reservoir behavior from hanford experience;
Instrumentation for water-temperature studies;
Summary of current theories and studies relating to temperature prediction.

PB-215 367
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE RADIAL DISTRIBUTION OF SULFUR DIOXIDE SOURCE STRENGTH AND CONCENTRATION IN NASHVILLE,
Ralph I. Larsen, William W. Stalker, and Charles R. Claydon. 1961, 23p
For presentation at the Annual Meeting (54th) of the Air Pollution Control Association, New York, N.Y., June 11-15, 1961.

Descriptors: (*Air pollution, *Tennessee), Sulfur dioxide.
Identifiers: *Nashville (Tennessee).

An air pollution study was conducted in Nashville, Tennesses in 1958-1959. The study was conducted to investigate possible relationships between air pollution and health and to obtain information on a number of the engineering and meteorologic phases of air pollution. As one aspect of the study, sulfur dioxide was studied intensely, from a detailed emission inventory to ambient air measurements using several sampling techniques. This paper discusses sulfur dioxide source strength and ambient levels of sulfur dioxide reported in terms of sulfation, using lead peroxide candles, as a function of radial distance from the center of Nashville.

PB-215 368
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
THERMAL POWER AND THE COST OF WASTE HEAT TREATMENT.

24 Sep 68, 30p

Descriptors: (*Nuclear power plants, *Heat recovery), Cost estimates.
Identifiers: *Water pollution control, *Thermal pollution.

An evaluation is made of the impact of waste heat treatment costs on the cost of power to consumers when new thermal nuclear power plants are integrated into an ongoing company system. The analysis presented attempts to analyze the incremental cost to the consumer of a nuclear-fueled thermal power unit, using Portland General Electric as the example utility, and the added increment to that cost attributable to the installation of a waste heat treatment method. The question of the importance of the resulting competitiveness in power rates between the Pacific Northwest and other regions is also indicated.

PB-215 369
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE GERMICIDAL EFFICIENCY OF SILVER, IODINE, AND QUATERNARY AMMONIUM COMPOUNDS,
Cecil W. Chambers. 1961, 44p
For Presentation at the Sanitary Engineering Conference on Disinfection and Chemical Oxidation in Water and Waste Treatment (3rd), University of Illinois, Urbana, Illinois, Jan 31-Feb 1, 1961.

Descriptors: (*Disinfection, Water treatment), (*Silver, Bactericides), (*Bactericides, *Water treatment), (*Iodine, Bactericides), (*Ammonium compounds, Bactericides), Chlorine oxides, Bromine, Ultraviolet radiation, Bacteriology, Water pollution.

In selecting a germicide for water treatment, certain criteria are important. The effect of pH, various ions, organic matter, temperature, and other chemical and physical factors on the microbicidal efficiency of the active agent are major considerations. Compatibility with chemicals necessary to other phases of treatment of the water supply should also be weighed. An evaluation of silver, quaternary ammonium compounds and iodine, with brief coverage of chlorine dioxide, bromine and ultraviolet light is reported.

PB-215 370
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SPECTROPHOTOMETRIC DETERMINATION OF AZULENE WITH ELECTROPHILIC REAGENTS,
Eugene Sawicki, Thomas W. Stanley, and Walter Elbert. 1961, 14p

Descriptors: (*Azulenes, *Colorimetric analysis), (*Spectroscopic analysis, Azulenes).

The colors, wave length maxima, absorptivities, concentration limits, dilution factors, spectral detection limits, Beer's law ranges, color stabilities and interferences of 12 diverse methods for the determination of azulene are compared. Eleven of these methods are new. The molar absorptivities of the different methods range from 17,000 to 110,000. All methods have a concentration limit more sensitive than 1 ppm of azulene; all methods can detect less than a microgram of azulene. For all procedures the structure of the final chromogen has been deduced.

PB-215 371
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WOOD WASTE INCINERATION.
Technical rept.,
M. Popovich, M. Northcraft, R. W. Boubel, and G. E. Thornburgh. 1961, 9p SEC-TR-A61-3

Descriptors: (*Air pollution, Combustion products), (*Incinerators, Air pollution), (*Wood wastes, Incinerators).
Identifiers: *Solid waste disposal.

The objective of the test program was to study the effects of variables in burner operation and design upon smoke and cinder discharge. During the first part of the program, the operation was studied of eight typical waste burners in normal millsite operation. In the second part, a model of approximately onethird average size was studied under closely controlled conditions.

PB-215 372
Department of Health, Education and Welfare, Washington, D.C.
TRANSCRIPT OF PROCEEDINGS OF THE PROGRESS EVALUATION MEETING IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE MISSOURI RIVER, OMAHA, NEBRASKA AREA (NEBRASKA-IOWA-MISSOURI-KANSAS) HELD AT THE REGIS HOTEL, OMAHA, NEBRASKA, ON FEBRUARY 11 AND 12, 1965. (INCLUDES APPENDED SUMMARIES OF 1ST SESSION OF CONFERENCE, JUNE 14, 1957, AND 2ND SESSION, JULY 21, 1964).

1965, 170p

Descriptors: (*Missouri River, *Water pollution), (*Nebraska, Water pollution), (*Iowa, Water pollution), (*Missouri, Water pollution), (*Kansas, Water pollution).
Identifiers: *Omaha (Nebraska).

Contents:
First and second sessions, conference in the matter of pollution of the interstate waters, Missouri River - Omaha, Nebraska area - summaries;
Nebraska Water Pollution Control Council meeting of November 24, 1964;
Omaha report on Missouri River sewage treatment plant breakdowns;
Letter indicating absence of grease at Metropolitan Utilities District water treatment plant intake;
Minutes of first two meetings of Technical Committee;
Opinion regarding legality of Lease-Purchase Procedure.

PB-215 373
Federal Water Quality Administration, Kansas City, Mo. Missouri Basin Region.
LA JUNTA, COLORADO. TECHNICAL ASSISTANCE PROJECT. SEPTEMBER 21-OCTOBER 4, 1970 AND OCTOBER 13-OCTOBER 19, 1970.

Oct 70, 37p

Descriptors: (*Sewage treatment, *Colorado).
Identifiers: La Junta (Colorado), *Sewage treatment plants.

The project was to improve the overall operation of the La Junta sewage treatment plant. This activated sludge plant was subjected to a heavy seasonal cannery load which increased the difficulty of operation. The primary objective was to provide the operating and control methods to ensure that a high quality effluent was produced.

PB-215 374
Massachusetts Inst. of Tech., Cambridge. Hydrodynamics Lab.
NUMERICAL AND ANALYTICAL SOLUTIONS OF DISPERSION PROBLEMS IN HOMOGENEOUS AND LAYERED AQUIFERS,
Uri Y. Shamir, and Donald R. F. Harleman. May 66, 213p 89, RR66-14
Grant FWPCA-WP-00711

Descriptors: (*Water pollution, Hydrology), (*Aquifers, Hydrology), (*Hydrology, Mathematical models), Computer programs.

From a review of previous work on dispersion in porous media it is concluded that at present the tools for solving most practical problems of mixing of fluids in artificial recharge, waste water disposal and ground water contamination are still missing. A numerical method is proposed for the solution of dispersion problems in steady three-dimensional potential flow fields in porous media. The numerical scheme uses the convective dispersion equation in curvilinear coordinates consisting of the flow streamlines and equipotentials. By means of this equation any problem of dispersion in a steady three-dimensional potential flow fields in porous media. The numerical scheme uses the convective dispersion equation in curvilinear coordinates consisting of the flow streamlines and equipotentials. By means of this equation any problem of dispersion in a steady potential flow field, as well as a special type of problems with unsteady flow, can be solved. The numerical scheme is programmed for a computer and applied to a few simple cases, for which analytical solutions exist.

PB-215 375
Beet Sugar Development Foundation, Fort Collins, Colo.
FACULTATIVE AND ALGAE PONDS FOR TREATING BEET SUGAR WASTES.
Progress rept. no. 3, 1 Jun 65-30 Jun 67,
James H. Fischer, Ronald A. Tsugita, W. J. Oswald, Clarence G. Golueke, and Robert C. Cooper. 15 Dec 67, 89p

Descriptors: (*Food processing, *Industrial waste treatment).
Identifiers: *Sugar beet processing, *Water pollution control.

A total of 11 loadings with variable recirculation rates were used to demonstrate the effect of an

anaerobic-facultative-aerobic treatment system (in series) on the degradation of dissolved and suspended solids characteristically found in beet sugar flume waste waters. The effect of these treatments on odors was also determined.

PB-215 376
Public Health Service, Washington, D.C. Bureau of State Services.
REFUSE COLLECTION AND DISPOSAL. AN ANNOTATED BIBLIOGRAPHY 1954-1955.
Bibliography series.

1955, 37P PHS-Pub-91-Suppl-B, PHS-BS-4-Suppl-B
Supplement to Rept. no. PHS-Pub-91 dated Jul 53.

Descriptors: (*Waste disposal, *Bibliographies), Refuse disposal.
Identifiers: *Solid waste disposal.

The bibliography is the second supplement to PHS Publication No. 91, which included references published during 1941-1950. The supplement covers the period 1954-1955, and is arranged in sections which correspond to the various administrative and operational phases of the broad field of refuse collection and disposal. The references have been annotated for increased usability as an aid in the exchange of information in both the research and operational phases of refuse sanitation activities. (Author Modified Abstract)

PB-215 377
Stanford Univ., Calif.
RECLAMATION OF RE-USABLE WATER FROM SEWAGE.
Progress rept. 15 Sep 62-15 Jul 63,
Rolf Eliassen. 9 Aug 63, 19p
Grant WPD-21-01-63

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Chemical removal (Sewage treatment), *Water reclamation), Activated sludge process.
Identifiers: *Tertiary sewage treatment.

The objective of the project is to demonstrate the feasibility of using tertiary and advanced treatment techniques in the reclamation of water from sewage. The report covers laboratory studies and construction of a pilot scale model at the Palo Alto Sewage Treatment Plant.

PB-215 378
Environmental Health Center, Cincinnati, Ohio.
GARBAGE DISPOSAL UNITS AND HOME SEWERAGE SYSTEMS,
James B. Coulter. 1952, 21p
For presentation at the short course for Electrification Advisers, Tennessee Univ., Knoxville. 30 Oct 52.

Descriptors: (*Septic tanks, *Garbage disposal).
Identifiers: *Garbage grinders.

The purpose of the project is to develop a sound scientific basis for the design of septic tank-soil absorption systems. A special study was made to determine the consequences of super-imposed loadings. One such study was concerned with the disposal of ground garbage.

PB-215 379
Public Health Service, Portland, Oreg. Economic Studies Group.
UMPQUA RIVER AREA (OREGON): PRELIMINARY ESTIMATE OF ECONOMIC GROWTH, 1960-2010.

Oct 61, 10p

Descriptors: (*Umpqua River Basin, *Economic development), (*Oregon, Economic development), Columbia River Basin.
Identifiers: *Douglas County (Oregon).

The paper is intended to provide a preliminary estimate of the economic potentials and a broad guide to the anticipated growth of the subject area. The paper is intended only as an initial estimate of the outlook for the Umpqua River area. Subsequently, in connection with the Columbia basin study, an analysis will be made, on an industry-by-industry basis, of the growth potential in such subbasins as the Umpqua. At that time, this preliminary estimate for the Umpqua area will be reviewed, and revised if necessary. (Author)

PB-215 380
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN OMAHA INTERSTATE AIR QUALITY CONTROL REGION (NEBRASKA AND IOWA).

Mar 70, 74p APTD-1187

Descriptors: (*Air pollution, *Nebraska), (*Air pollution, *Iowa).
Identifiers: *Omaha (Nebraska), *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adaptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the Omaha Metropolitan Area covering parts of both Nebraska and Iowa. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 381
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
POLLUTION OF THE WATERS OF THE GRAND CALUMET RIVER, LITTLE CALUMET RIVER, CALUMET RIVER, LAKE MICHIGAN, WOLF LAKE AND THEIR TRIBUTARIES. ILLINOIS - INDIANA.

Feb 65, 96p

Descriptors: (*Calumet River, *Water pollution), (*Lake Michigan, *Water pollution), (*Illinois, Water pollution).
Identifiers: *Water quality data.

A technical report is made on interstate pollution problems in the Calumet area, Indiana and Illinois. The waters under consideration are the Grand Calumet River, Little Calumet River, Calumet River, Lake Michigan, Wolf Lake and their tributaries. Findings are based on data obtained from State, local, and sanitary district records, industries, and sampling by the Public Health Service. The report considers the quality characeristics of the waters as they exist in 1965, evaluates the effects of waste discharges on the water quality and water uses, and summarizes the principal problems and needed corrections.

PB-215 382
Federal Water Pollution Control Administration, Washington, D.C.
GUIDELINES FOR ESTABLISHING WATER QUALITY STANDARDS FOR INTERSTATE WATERS (UNDER THE WATER QUALITY ACT OF 1965, PUBLIC LAW 89-234).

May 66, 13p

Descriptors: (*Water pollution, Standards), Recommendations, State governments.
Identifiers: *Water pollution standards.

The guidelines are presented to assist the States in the development of the required water quality criteria and the plan for the implementation and enforcement thereof, and to delineate factors which will be considered in the Secretary's determination of whether the criteria and plan are consistent with the purposes of the Act. (Author)

PB-215 383
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
BIOLOGY. A TECHNICAL REPORT CONTAINING BACKGROUND DATA FOR A WATER POLLUTION CONTROL PROGRAM.

Jan 68, 44p

Descriptors: (*Lake Michigan, *Biological surveys), (*Water pollution, Lake Michigan), Indicator species, Algae, Worms, Diptera, Limnology, Organic wastes, Phytoplankton.

Presented is a study of the biology of the Lake Michigan Basin. The biota of the mid-water area was found to reflect an unpolluted environment. Extensive inshore areas of pollution totaling 3,475 square miles were found along the entire southern perimeter of Lake Michigan specifically Milwaukee, Racine and Chicago-Calumet and in Green Bay. The loss of the Green Bay fly, a fish food organism, and other detrimental pollution associated conditions have impaired commercial fishing in Green Bay. Other more localized inshore areas of pollution totaling 350 square miles resulted in increased sludgeworms and free floating algal populations offshore. Pollution of inshore areas: PRODUCED DENSE GROWTHS OF ATTACHED ALGAE IN SHALLOW WATER AREAS THAT BREAK LOOSE AND BECOME DEPOSITED ON SWIMMING BEACHES.

PB-215 384
Sanitary Engineering Center, Cincinnati, Ohio.
LAKE LANIER POLLUTION SURVEY - LIMESTONE AND BALUS CREEKS. SUMMARY AND CONCLUSIONS.
Memorandum interim rept.
Feb 56, 49p

Descriptors: (*Water pollution, *Georgia), Lake Lanier.
Identifiers: *Water quality data, *Hall County (Georgia).

Surveys of pollution of Limestone Creek below the Pacolet Manufacturing Company sewage and textile waste treatment plant at New Holland, Georgia and of Balus Creek below the Chicopee Manufacturing Corporation textile-finishing plant at Chicopee, Georgia, were made during February 8 through 15, 1956. The purpose of the surveys were to: Establish the extent of present pollution as relating to present waste disposal methods by the two mills, and provide a factual basis for views regarding the probable extent of pollution after backwater from Lake Lanier on Chattahoochee River covers the lower sections of the two creeks.

PB-215 385
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
THE EFFECT OF IRRIGATION RETURN WATER ON THE BENTHIC MACROINVERTEBRATES OF THE LOST RIVER OREGON--CALIFORNIA.
Technical paper no. 2.

1969, 35P

Descriptors: (*Toxicology, Water pollution), (*Lost River, *Water pollution), (*Irrigation, Water pollution), (*California, Water pollution), (*Oregon, Water pollution), Invertebrates.
Identifiers: *Return flow, *Water pollution effects (Animals).

A survey of the benthic macroinvertebrates was made on the Lost River system to determine the effects of irrigation return water on these organisms. The survey was part of an overall investigation to determine the causes of past extensive wildfowl kills on the Tule Lake and Lower Klamath National Wildlife Refuges located within the Lost River system. One objective was to determine the effects of nutrients originating from agricultural land drainage upon recreation, water

supply and Federal wetlands and wildlife management areas.

PB-215 386
Federal Water Pollution Control Administration, Cincinnati, Ohio. Analytical Quality Control Lab.
LABORATORY GUIDE FOR THE IDENTIFICATION OF PETROLEUM PRODUCTS,
Fred K. Kawahara. Jan 69, 45p

Descriptors: (*Water pollution, Oils), (*Water analysis, *Oils), Hydrocarbons.
Identifiers: *Water pollution detection.

The report describes laboratory procedures for recovery and identification of petroleum products responsible for water pollution. Data obtained will facilitate locating and identifying sources of pollution.

PB-215 387
Public Health Service, Portland, Oreg. Economic Studies Group.
TENTATIVE ESTIMATES OF WILLAMETTE BASIN ECONOMIC GROWTH TO 1980 AND 2010.

Jun 61, 6p Working Paper-2

Descriptors: (*Willamette River Basin, *Economic development), (*Oregon, Economic development), River basin development.

The purpose of the report is to provide some general guides to potential economic growth in the Willamette Basin. Because of the limited nature of these estimates, industrial activities have been grouped into the broad categories shown below. Agriculture; Forestry, Fishing, Mining; Manufacturing-Lumber, plywood, wood prod., furn; Pulp, paper; Food and kindred products; All other manufacturing; Services (incl. construction).

PB-215 388
Kansas Univ., Lawrence. Center for Research in Engineering Science.
FURTHER INVESTIGATION INTO THE WATER QUALITY PARAMETERS USED IN THE LOWER KANSAS RIVER BASIN MODEL,
Walter J. O'Brien, and Ernest E. Angino. Jun 68, 194p
Contract DI-14-12-58

Descriptors: (*Kansas River, *Water pollution), (*Kansas, Water pollution), Mathematical models, Computer programs.
Identifiers: *Water quality data.

A modification of the discharge translation procedure used in the Lower Kansas River quality model is presented. The conservative water quality vectors used in the model have also been refined to produce improved correlation between the predicted and observed concentrations of chloride, sulfate, calcium, and magnesium as a function of the discharge in the river system. A method for predicting the percentage composition and the concentration of conservative parameters in the reservoirs of the region from pre-impoundment water quality data is presented. The non-conservative and the temperature data available on the region are also summarized in a form suitable for use in the model.

PB-215 389
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
A HISTORY OF WATER POLLUTION CONTROL IN THE WILLAMETTE BASIN, OREGON.

Jun 65, 63p Working Paper-56

Descriptors: (*Oregon, Water pollution), (*Willamette River Basin, *Water pollution), History, Abatement.
Identifiers: *Water pollution abatement.

It is intended that the report will serve several purposes, all oriented towards improvement of the quality of the waters of the Willamette River Basin. (Author)

PB-215 390
New York Univ., N.Y.
CATION TOXICITY AND STIMULATION IN ANAEROBIC WASTE TREATMENT. II: DAILY FEED STUDIES,
Irwin J. Kugelman, and Perry L. McCarty. 1964, 31p
Presented at the Annual Purdue Industrial Waste Treatment Conference (19th), Lafayette, Ind. 6 May 64.

Descriptors: (*Sewage treatment, Anaerobic processes), (*Microorganism control (Sewage), *Anaerobic processes), Trace elements.

One fundamental principle which waste water treatment research has brought forth is that optimum efficiency in a biological waste treatment system can be attained only when the microorganisms functioning in the process are provided with an optimum environment. In the future, biological waste treatment systems will be called upon more to handle wastes of an entirely different nature from that of domestic sewage sludge. In order to prepare for these future conditions, a basic investigation of cation effects in the anaerobic waste treatment process was undertaken.

PB-215 391
Public Health Service, Kansas City, Mo. Region VI.
STATEMENT WATER QUALITY MANAGEMENT AND POLLUTION CONTROL PROGRAM IN IOWA, KANSAS, MISSOURI, AND NEBRASKA. VOLUME I, TEXT.
May 64, 53p

Descriptors: (*Iowa, Water pollution), (*Kansas, Water pollution), (*Missouri, Water pollution), (*Nebraska, Water pollution).
Identifiers: Government agencies.

The report outlines activities and plans of the Public Health Service of the U. S. Department of Health, Education and Welfare as carried out through the Region VI office. It includes a description of the four-state area concerned; a summary of water resources activities; water quality and basic data and their interpretation; construction grants activities; enforcement actions; and a description of activities concerning waste discharges from fedreral installations.

PB-215 392
Pacific Northwest Water Lab., Corvallis, Oreg.
COMPREHENSIVE WATER POLLUTION CONTROL PLANNING.

14 Apr 65, 65p
Proceedings of the Pacific Northwest Symposium on Water Pollution Research (13th).

Descriptors: (*Water pollution, Abatement), Meetings.
Identifiers: *Water pollution control, *Water pollution abatement.

Contents:
- Comprehensive water pollution control planning;
- Columbia River basin comprehensive water pollution control project;
- Use and role of water pollution control plan by other federal agencies;
- The state's role and use of pollution control plan;
- Why should a municipality be interested in a comprehensive river basin plan for water pollution control;
- Industry's role and participation in water pollution control planning;
- Symposium summary - research needs to improve water pollution control planning.

PB-215 393
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE MERRIMACK VALLEY-SOUTHERN NEW HAMPSHIRE INTERSTATE AIR QUALITY CONTROL REGION (MASSACHUSETTS AND NEW HAMPSHIRE).

Jun 70, 107p APTD-1208

Descriptors: (*Merrimack Valley, *Air pollution), (*Air pollution, *Massachusetts), (*Air pollution, *New Hampshire).
Identifiers: *Air quality data.

The clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of Merrimack Valley, New Hampshire and Massachusetts. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 394
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
TECHNIQUE FOR COLLECTING INTEGRATED SAMPLES OF GASEOUS INDUSTRIAL EFFLUENTS,
Richard S. Brief, and Philip A. Drinker. 1957, 14p
For presentation at the Annual Meeting of the American Industrial Hygiene Association, St. Louis, Mo., April 25, 1957.

Descriptors: (*Gas sampling, *Flue gases), (*Air pollution, Gas sampling), Samplers.

A technique for the determination of contaminants in gaseous effluents from both cyclic and continuous industrail operations is presented. The sampling train, made entirely of glass, is easily manipulated in the field to obtain integrated samples over periods up to two hours. Standard mass spectrometric methods of analysis give results to 0.01 mole percent. (Author)

PB-215 395
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN CHARLOTTE INTERSTATE AIR QUALITY CONTROL REGION (NORTH CAROLINA AND SOUTH CAROLINA).
May 70, 74p APTD-1201

Descriptors: (*North Carolina, *Air pollution), (*South Carolina, *Air pollution).
Identifiers: *Charlotte (North Carolina), *Air quality data.

The clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the metropolitan Charlotte area in North and South Carolina. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 396
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION.

Mar 69, 52p APTD-1223

Descriptors: (*Kansas, *Air pollution), (*Missouri, *Air pollution).

Identifiers: *Kansas City Metropolitan Area, *Air quality data.

The clean Air Act requires the designation of 'air quality control regions' prior to the adoption of air quality standards and plans for implementation of the standards. A study was thus conducted of the metropolitan Kansas City area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 397
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN PORTLAND INTRASTATE AIR QUALITY CONTROL REGION (MAINE).

May 70, 84p

Descriptors: (*Oregon, *Air pollution).
Identifiers: *Portland (Oregon), *Air quality data.

The Clean Air Act stipulates that the designation of a control region shall be preceded by consultation with appropriate state and local authorities. This report is intended to provide the basic background information needed for the consultation. It proposes boundaries for the metropolitan Portland Intrastate Air Quality Control Region and discusses the factors which are the basis of the proposed boundaries.

PB-215 398
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
TREATMENT OF BEET SUGAR WASTES,
Hayse H. Black. 1954, 21p
Presented at the Ontario Industrial Waste Conference (1st), Ontario Agricultural College, Guelph, Ontario, June 15-18, 1954.

Descriptors: (*Food processing, *Industrial waste treatment), (*Water pollution, *Industrial wastes).
Identifiers: *Sugar beet processing, *Water pollution control.

The report describes the processes involved in beet sugar extraction, details the wastes involved, the pollutional effects of the wastes, and presents several methods for combatting the detrimental effects of the waste materials.

PB-215 399
North American Aviation, Inc., Downey, Calif. Space and Information Systems Div.
A STUDY OF THE USE OF BIOMASS SYSTEMS IN WATER RENOVATION.
Final rept.

1 May 67, 114p SID-67-401
Contract PH-86-65-31

Descriptors: (*Water treatment, Algae), (*Algae, *Sewage treatment), (*Food, Algae), Photosynthesis, Decomposition reactions, Nutrients, Water pollution, Cost estimates, Plankton, Plant growth, Harvesting, Pilot plants.
Identifiers: *Food supplements, *High protein supplements.

The report presents the results of research to determine the feasibility of utilizing high-rate algae ponds to produce water suitable for recreational purposes from domestic sewage. Also the feasibility of using dried algae from these ponds as a source of protein for animal feeds was determined. Data on the techniques and costs of harvesting algae, also needed for economic analyses, were obtained. Also presented is a tentative cost analysis of sewage treatment plants to assess economic feasibility of biomass systems plants.

PB-215 400
Oak Ridge National Lab., Tenn.
INTERIM PROGRESS REPORT ON THE DECONTAMINATION OF RADIOACTIVE WATERS,
Roy J. Morton, and Conrad P. Straub. May 53, 133p

Descriptors: (*Water pollution, *Radioactive contaminants), Accumulation, Residues, Radiation measuring instruments.
Identifiers: *Water pollution control.

The report includes a short summary entitled Conclusions Based Upon the Interim Progress Report on the Decontamination of Radioactive Waters. The detailed report which follows the summary covers the following subjects: Research on the decontamination of radioactive waters, the problem of radioactivity in water courses, concentration of radioactivity by natural agents, water decontamination, and instrumentation. (Author)

PB-215 401
Public Health Service, Portland, Oreg. Region IX.
RETURN IRRIGATION WATER. CHARACTERISTICS AND EFFECTS,
Edward F. Eldridge. 1 May 60, 129p

Descriptors: (*Water pollution, Irrigation), (*Irrigation, *Water quality), Minerals, Turbidity, Aquatic biology, Inorganic nitrates, Bacteria, Water supply, Salinity, Temperature, Nutrients, Odors, Inorganic phosphates, Chemical composition.
Identifiers: *Return flow, Water quality data.

The paper documents that return irrigation water is a major factor affecting the quality of surface and ground waters. The report discussed the quantity and quality of the water required for irrigation, the disposition and use of this water, the factors influencing the quantity and quality of the water returned to surface or ground supplies, and the effects of this return flow on further use of the supplies in a complex of multiple uses. The investigation has shown that the potential water quality problems involve changes in salinity and hardness, temperature, turbidity, nutrients and aquatic growths, odor and taste, nitrates, and sanitary quality. Each of these factors is developed and documented and the actual and potential effects on water uses are analyzed. The major water uses considered are domestic and industrial water supply, fisheries, recreation and irrigation.

PB-215 402
Public Health Service, Washington, D.C.
POLLUTION OF INTERSTATE WATERS MISSOURI RIVER, SIOUX CITY, IOWA, 23-27 MARCH 1959 (TRANSCRIP OF HEARING). VOLUME 1.

27 Mar 59, 235p

Descriptors: (*Missouri River, *Water pollution), (*Iowa, Water pollution), Sewage, Industrial wastes.
Identifiers: *Sioux City (Iowa).

The report presents the text of the court hearings concerning the pollution of the Missouri River by Sioux City, Iowa's sewage discharges and wastes from industries located in Sioux City.

PB-215 403
Federal Water Pollution Control Administration, Cincinnati, Ohio. Div. of Technical Support.
BLACK-WATER IMPOUNDMENT INVESTIGATIONS,
Richard W. Warner, R. Kent Ballentine, and Lowell E. Keup. 1969, 99p

Descriptors: (*Reservoirs, *Northeast Cape Fear River), (*North Carolina, Reservoirs), Water quality.
Identifiers: *Duplin County (North Carolina).

In late July and early August, 1968, a study was conducted to predict the quality of Northeast Cape Fear River waters to be impounded in Kornegay Reservoir, Duplin County, North Carolina. This study was requested by the Corps of Engineers because the highly colored river water will inundate rich organic soils and vegetation that may leach undesirable materials and affect water quality adversely for fish propagation, wildlife, flow augmentation, water supply, and recreation. To assess the magnitude of the problem and to predict the effects of removal of vegetation and soils from the reservoir site, chemical and biological conditions of the Northeast Cape Fear River were compared with those of two small reservoirs with highly colored influents near Wilson, N. C.

PB-215 404
Federal Water Pollution Control Administration, Metuchen, N.J. Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project.
REPORT ON THE POLLUTION OF THE WATERS OF MOODNA CREEK IN THE VICINITY OF NEW WINDSOR, NEW YORK.

Nov 66, 27p

Descriptors: (*Moodna Creek, *Water pollution), (*New York, Water pollution), Hudson River.

Moodna Creek, a small tributary of the Hudson River near New Windsor, New York, whose lower reaches are affected by tidal action, receives the discharge of raw and/or inadequately treated municipal sewage and industrial waste. Large amounts of waste materials have accumulated in the tidal portion of the Creek, the decay of which has resulted in the evolution of gases and noxious odors. The problem has become more pronounced during an extended drought. Immediate and long range relief measures are discussed.

PB-215 405
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER SUPPLY AND QUALITY CONTROL STUDY. TWIN SPRINGS PROJECT: BOISE RIVER BASIN.
Aug 66, 68p

Descriptors: (*Boise River Basin, *Water supply), (*Idaho, Water supply), Water pollution.

An investigation defining present and potential water needs for municipal and industrial (M and I) supply and stream flow needs for maintenance of water quality in Boise River Basin is discussed. A need for additional source development for M and I supply and for storage for regulation of stream flow for water quality control is revealed. Future water requirements and quality projections are based on economic, demographic, and engineering studies. (Author)

PB-215 406
Environmental Health Center, Cincinnati, Ohio.
THE GLIDDEN COMPANY, NAVAL STORES DIVISION, JACKSONVILLE, FLORIDA. A STUDY OF THE CHARACTERISTICS OF THE WASTES RESULTING FROM THE DESTRUCTIVE DISTILLATION OF PINE WOOD.
Industrial waste survey rept. 4 Feb-28 Feb 52,
Virgil A. Minch, and Robert L. Harris. 28 Feb 52, 61p

Descriptors: (*Wood products, *Industrial wastes), (*Water pollution, Wood products).
Identifiers: *Wood processing industry.

The liquid waste directly resulting from the wood pyrolysis is known as pyroligneous acid liquor and is an extremely complex mixture containing at least 35 identifiable organic compounds, many of which are water soluble. It is a dark red-brown liquid having a strong acid reaction and a peculiar

empyreumatic odor. The yield of pyroligneous acid liquor from softwood distillation is 50 to 60 per cent of the weight of the wood processed. The volume at the plant amounted to 15,000 gallons per day. This waste has limited uses as a disinfectant, weed killer, and meat curing agent, but probably accounts for less than 2 per cent of the total production. The largest percentage goes to waste. The only other waste associated with the destructive distillation process is condenser cooling water. (Author)

PB-215 407
Michigan Univ., Ann Arbor. Div. of Sanitary and Water Resources Engineering.
A MATHEMATICAL MODEL FOR PREDICTION OF CONCENTRATION-TIME PROFILES FOR DESIGN OF FLUID-BED ADSORBERS.
Technical pub.,
Thomas M. Keinath, and Walter J. Weber, Jr. Apr 68, 185p T-68-2
Contract FWPCA-WP-00706

Descriptors: (*Fluidized bed processors, *Activated carbon treatment), (*Sewage treatment, Activated carbon treatment).

The report develops a mathematical model for predicting effluent concentration-time profiles for continuous flow fluidized systems by measurement of selected adsorption parameters from critically designed non-flow system experiments.

PB-215 408
Public Health Service, Washington, D.C.
PROCEEDINGS OF SHELLFISH SANITATION WORKSHOP, 27-28 AUGUST 1956.
28 Aug 56, 146p

Descriptors: (*Food sanitation, *Shellfish), (*Water pollution, Shellfish), Seafood, Sewage, Bacteriology, Standards, Food processing, Food industry, Public health, Proceedings.

Application of research results to sanitation procedures; Discussion of current administrative problems; and Final changes in the revision of the Manual of Recommended Practice for Sanitary Control of the Shellfish Industry.

PB-215 409
Federal Water Pollution Control Administration, Cincinnati, Ohio.
PRELIMINARY DESIGN AND SIMULATION OF CONVENTIONAL WASTEWATER RENOVATION SYSTEMS USING THE DIGITAL COMPUTER.
Water pollution control research series,
Robert Smith. Mar 68, 129p WP-20-9

Descriptors: (*Sewage treatment, *Cost analysis), Design, Computer programs.

Over the past 50 years extensive research has been conducted by universities, equipment manufacturers, and governmental agencies to delineate the physical, chemical, and biological relationships which govern the operation of wastewater treatment processes. The literature on the performance of the individual processes is voluminous but the techniques for calculating the performance of groups of processes working together as a system are limited. The report is an effort to bring together in one computational scheme the significant cost and performance relationships for the processes and to attempt to calculate the performance and cost of the system as a whole, based on relationships which have been developed for the processes individually. (Author)

PB-215 410
Public Health Service, San Francisco, Calif. Region IX.
COMPILATION OF INFORMATION RELATED TO WATER QUALITY OF LAKE TAHOE,
Carl M. Walter, Robert F. Minnehan, and Ferdinand A. Piglowski. Sep 61, 61p

Descriptors: (*Lake Tahoe, *Water pollution), (*California, Water pollution).
Identifiers: *Water quality data.

The report is intended to present the most recently available data and information pertaining to water quality in the Lake Tahoe Basin. These data and information are arranged in four sections as follows: economic development, water uses, waste disposal and water quality. Supporting tables and appendices of supplementary information are included. (Author)

PB-215 411
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Technical Support Lab.
WATER QUALITY SURVEY OF THE EASTERN SHORE NANTICOKE RIVER, MARSHALL CREEK, BUNTING BRANCH AND CHINCOTEAGUE BAY.
Data rept.

1967, 41P

Descriptors: (*Maryland, Water pollution), (*Delaware, Water pollution), (*Virginia, Water pollution), (*Wicomico River, Water pollution), (*Pocomoke River, Water pollution), (*Nanticoke River, Water pollution), (*Chincoteague Bay, Water pollution), Chesapeake Bay.
Identifiers: *Water quality data.

During the summer of 1967, the Chesapeake Support Laboratory, Middle Atlantic Region, Federal Water Pollution Control Administration conducted investigations to obtain background water quality information in the major river basins, and three smaller areas, of the eastern shore of Chesapeake Bay (Delaware, Maryland and Virginia). The results of these investigations with sampling and analytical methods are presented in the report.

PB-215 412
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
THERMAL POLLUTION, ITS EFFECTS AND TREATMENT,
Robert W. Zeller. 9 Jan 70, 28p Working Paper-72
Presented at the Conference on Wastes Engineering, University of Minnesota, Minneapolis, 9 Jan 70.

Descriptors: (*Water pollution, Heat), (*Electric power plants, Water pollution), (*Heat recovery, *Industrial water).
Identifiers: *Thermal pollution, *Water pollution control.

The report reviews the following aspects of thermal pollution: Power needs; Thermal electric power generation as a waste heat source; Thermal pollution effects; Waste heat treatment; Waste heat utilization; and Thermal power plant siting criteria and procedures.

PB-215 413
Federal Water Pollution Control Administration, Boston, Mass. Northeast Region.
REPORT ON POLLUTION OF INTERSTATE WATERS OF THE CONNECTICUT RIVER, MASSACHUSETTS/CONNECTICUT (SECOND SESSION).

Sep 67, 14p

Descriptors: (*Connecticut River, *Water pollution), (*Massachusetts, Water pollution), (*Connecticut, Water pollution).

The report briefly presents the results of a conference on the water quality of the Connecticut River and the recommendations from it. Briefly described are the area, water uses, and abatement needs.

PB-215 414
Rutgers - The State Univ., New Brunswick, N.J. Water Resources Research Inst.
OXYGEN UPTAKE RATES OF BENTHAL DEPOSITS ON THE UPPER PASSIAC RIVER,
O. M. Donovan, and J. V. Hunter. 1969, 29p

Descriptors: (*Passiac River, *Dissolved gases), (*Benthos, Oxygen).
Identifiers: *Oxygen demand.

An in situ benthal respirometer was utilized to determine benthal oxygen demands on the Passaic river near Little Falls, New Jersey. Different deposits on the stream were examined for exhibited demands. These demands were then examined from the viewpoint of their effects upon the overall stream oxygen balance. The data are presented in tabular and graphic forms.

PB-215 415
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
GUIDELINES FOR PREPARATION OF REPORTS.

Mar 68, 33p

Descriptors: (*Water pollution, *Technical writing).

The manual was prepared largely for use by the writers and typists of technical reports in the Northwest Regional Water Pollution Control offices, although others may find it useful. The material is generally presented in two sections. The first chapter, 'Report Organization Guidelines,' is directed primarily to the report writers. The second chapter, 'Report typing Guidelines,' and the attached examples in the Appendix, are for use by report typists. Both the writer and the typist should be familiar with both sections to assist each other in attaining compatibility in report preparation efforts.

PB-215 416/9
Oklahoma Univ. Research Inst., Norman.
DEMONSTRATION OF A FULL-SCALE WASTE TREATMENT SYSTEM FOR A CANNERY.
Water pollution control research series,
Leale E. Streebin, George W. Reid, and Alan C. H. Hu. Sep 71, 184p EPA-12060-DSB-09/71
Paper copy available from GPO $1.50 as EPI.16:12060DSB-09/71.

Descriptors: (*Food processing, *Industrial waste treatment), (*Canneries, Industrial waste treatment), Activated sludge process, Aeration, Sludge digestion, Design criteria, Performance evaluation, Cost estimates, Capitalized costs, Operating costs.
Identifiers: *Water pollution control, *Fruit processing, Potato processing, *Vegetable processing, Biological industrial waste treatment.

The objectives in the study were to determine the removal efficiencies of a two-stage aerobic biological treatment system while processing high strength, large volume, nutritionally unbalanced cannery wastes, and to determine the waste characteristics resulting from the processing of a wide variety of fruits and vegetables. The system was studied over one operating season and data collected on the removal efficiencies of each unit process in the system. The treatment system performed more efficiently than expected in the design assumptions. Removal efficiencies of greater than 95% were obtained for most of the processing season, even though because of plant expansion the organic and hydraulic load was higher than expected.

PB-215 418
Eastern Illinois Univ., Charleston. Div of Life Sciences.
BIOLOGICAL SURVEY OF STREAM OF COLES COUNTY, ILLINOIS 1967-1970.
Water pollution control research series,
Leonard Durham, and Stephen L. Whitley. Jun 71, 144p EPA-18050-DZZ-06/71
Paper copy available from GPO $1.25 as EP1.16:1850DZZ-06/71.

Descriptors: (*Illinois, *Biological surveys), Lincoln Lake, Reservoirs, Benthos, Plankton, Fishes.
Identifiers: *Baseline measurements, *Coles County (Illinois).

Field and laboratory studies were carried out on 20 streams in Coles County, Illinois from 1967 through 1970. A large reservoir (Lincoln Lake) is planned by the Army Corps of Engineers and, if completed, will have considerable impact on Coles County. A record of existing conditions was desired in order to help determine the effects of the reservoir in the area. Studies were made of the bottom fauna, plankton, and fishes in the streams. Physical and chemical characteristics such as pH, hardness, dissolved oxygen, turbidity, nitrites, nitrates, phosphates, sulfates, and carbon dioxide were also measured. (Author)

PB-215 419
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE WATER SUPPLY AND WATER POLLUTION PROGRAM OF THE ROBERT A. TAFT SANITARY ENGINEERING CENTER,
Bernard B. Berger. 1957, 18p
Presented at Annual Water Symposium (6th), Louisiana State University, Baton Rouge, Louisiana, February 20, 1957.

Descriptors: (*Water pollution, Research).

The work of the Robert A. Taft Sanitary Engineering Center is concerned with the effects on public health and well-being of contaminated air, water, and food, and of radioactivity. In each of these areas, three basic activities are conducted: research, technical assistance, and training. The report describes the Center's program in the water phase of the environment. (Author)

PB-215 451
Public Health Service, Kansas City, Mo. Region VI.
REPORT OF SUPPLEMENTAL SURVEY, NORTH PLATTE RIVER, TORRINGTON, WYOMING, BRIDGEPORT, NEBRASKA, OCTOBER 14-26, 1963.
1963, 24p

Descriptors: (*Platte River Basin, *Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution).
Identifiers: *Water quality data.

The purpose of the survey was to determine the source of the high bacteriological concentration found in the interstate reach of the North Platte River, to up-date chemical and biological data pertaining to this reach of the river, and to evaluate effectiveness of waste treatment facilities installed since the survey of November-December 1962.

PB-215 457
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
RESULTS OF THE LOW FLOW CARBON FILTER WHEN USED AS A PESTICIDE SAMPLER.

28 Oct 66, 21p Technical paper-1
Report on Kalmath Basin Study.

Descriptors: (*Pesticides, *Water analysis), Sampling, Activated carbon.
Identifiers: *Water pollution detection.

The report describes the testing of a low flow carbon filter to provide an average concentration sample for the pesticide content in water. The accuracy was tested and found favorable.

PB-215 458
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
PACIFIC NORTHWEST WATER LABORATORY QUARTERLY REPORT, APRIL 1 THROUGH JUNE 30, 1969.

Jul 69, 50p

Descriptors: (*Water pollution, Research).
Identifiers: *Pacific Northwest Water Laboratory.

The report presents summaries of research in the following areas: Waste treatment; Thermal pollution; Coastal pollution; Eutrophication; and Biological effects.

PB-215 459
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
NUTRIENT REMOVAL BY ADVANCED WASTE TREATMENT,
James J. Westrick. 1973, 34p

Descriptors: (*Sewage treatment, *Nutrients), (*Chemical removal (Sewage treatment), Nutrients).
Identifiers: *Nutrient removal.

The paper briefly surveys the more promising advanced waste treatment methods which have been or are being developed for the removal of nitrogen and phosphorus from wastewaters. (Author)

PB-215 460
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
WATER QUALITY, MIDDLE BASIN TRIBUTARY STREAMS, SOUTH PLATTE RIVER BASIN, SUMMER 1965.

Dec 67, 69p PR-7

Descriptors: (*Cache la Poudre River, *Water pollution), (*Colorado, Water pollution), Platte River Basin.
Identifiers: *Water quality data.

The primary objectives of the study were to: Develop knowledge of the water quality in the Cache la Poudre River, Big Thompson River, and St. Vrain Creek sub-basins during the summer months; Evaluate water quality in terms of present and future water uses; Determine water quality control needs. It was important to determine water quality during a time when beet sugar factories were not operating; the masking effects of beet sugar wastes could be eliminated and other causes and effects analyzed.

PB-215 461
Alaska Univ., College. Inst. of Water Resources.
EVALUATION OF AN OXIDATION-DITCH WASTEWATER TREATMENT PLANT IN SUB-ARCTIC ALASKA.
Progress rept. 15 Jun 67-15 May 68,
R. Sage Murphy. 20 May 68, 12p
Grant WPD-207-01-67

Descriptors: (*Sewage treatment, Cold weather operations), (*Lagoons (Ponds), *Cold weather operations), Channels (Waterways).
Identifiers: *Aeration ponds.

The paper presents the progress made at the oxidation-ditch wastewater treatment plant in sub-arctic Alaska. The facility was inundated during the disastrous Fairbanks flood of August 15, 1967. Restarting the plant was performed soon thereafter and this report covers only that period until May 15, 1968. Consistent Biochemical Oxygen Demand removals in excess of 90 percent were achieved even when liquid temperatures as low as 2C were prevalent. No mechanical failures could be attributable to the cold environment when average air temperatures of -49C lasted for ten days. Nitrification by the activated sludge was completely inhibited at liquid temperatures below 10C.

PB-215 462
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
EFFECTS OF AEROSOLS IN THE COMMUNITY ATMOSPHERE,
David M. Anderson. 10 Mar 59, 19p

Descriptors: (*Air pollution, *Aerosols), (*Public health, Air pollution), Reviews, Particles.

The discussion is mainly concerned with the effects of aerosols in the community atmosphere as distinguished from the occupational environment. Research in the latter area, however, at present constitutes our only knowledge for many biological effects. Material has been gathered from a literature review of some 60 sources and is presented in summary style. The subjects considered are the biological, physical and economic effects of atmospheric pollutant aerosols, referring only to the particulate phase, either solid or liquid. Consideration is given to the possible carrier and/or catalytic nature of particulates which sometimes may account for the detrimental effects attributed to the aerosol, in both biological and physical systems. (Author)

PB-215 463
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
NORTHWEST REGIONAL MULTI-AGENCY OIL AND HAZARDOUS MATERIALS POLLUTION CONTINGENCY PLAN.
Jan 69, 61p

Descriptors: (*Hazardous materials, *Water pollution), (*Water pollution, Oils), (*Pacific Northwest, Water pollution), Strategies, Government policies.
Identifiers: *Oil pollution control, *Contingency plans.

The objective of the document is to present a plan which will establish a workable chain of authority and responsibility among local, State, and Federal agencies involved in controlling and cleaning up a major spill of oil or other hazardous materials that may occur in the Pacific Northwest Region, which includes the States of Washington, Oregon, Idaho, and Western Montana. A separate contingency plan is being developed for the State of Alaska. (Author)

PB-215 464
Environmental Health Center, Cincinnati, Ohio.
BEET SUGAR: AN INDUSTRIAL WASTE GUIDE TO THE BEET SUGAR INDUSTRY.

Dec 50, 27p

Descriptors: (*Food processing, *Industrial waste treatment).
Identifiers: *Sugar beet processing, *Water pollution control.

The report presents a detailed account of the processes used to convert sugar beets to raw sugar, describes the pollutional effects resulting, and suggests remedial measures to alleviate the detrimental effects.

PB-215 465
Environmental Health Center, Cincinnati, Ohio.
STUDIES OF BATHING WATER QUALITY AND HEALTH,
Albert H. Stevenson. 1952, 14p

Presented at Session of the Engineering Section of the American Public Health Association (2nd) at the Annual Meeting (80th) in Cleveland, Ohio, October 23, 1952.

Descriptors: (*Water pollution, *Swimming), (*Lake Michigan, Water pollution), (*Ohio River, Water pollution), (*Long Island Sound, Water pollution), (*Publicc health, Swimming), Epidemiology, Infections, Bacteriology, Environmental surveys, Beaches, Kentucky, Illinois, New York.
Identifiers: Dayton (Kentucky).

In an attempt to determine the relationship between natural bathing water quality and its effect upon the health of the bather, a series of field studies were recently undertaken. The specific objectives of the studies were: to determine what frequency of swimming might be expected from the population groups chosen; to determine what relative increase in illness incidence might be expected from swimming in even the cleanest waters; and to determine what differences in illness incidence might be expected from swimming in waters containing various degrees of bacterial pollution. The studies were conducted on Lake Michigan at Chicago, Illinois; the Ohio River at Dayton, Kentucky, and a nearby swimming pool in the same area; and finally Long Island Sound at New Rochelle and Mamaroneck, New York.

PB-215 466
Federal Water Pollution Control Administration, Cincinnati, Ohio. Ohio Basin Region.
LAKE ERIE SURVAILLANCE DATA SUMMARY, 1967-1968.

May 68, 69p

Descriptors: (*Lake Erie, *Water pollution), Plankton, Chemical composition.
Identifiers: *Water quality data.

The report is the first of an anticipated annual series to be prepared by the Cleveland Program Office of the Federal Water Pollution Control Administration, Great Lakes Region. All significant data gathered by the Cleveland and Detroit Program Offices in their surveillance monitoring programs on Lake Erie will be included. The purpose of the reports is to chronicle water quality changes in Lake Erie. The report presents data on plankton and chemical concentrations taken during 1967-68.

PB-215 467
Federal Water Pollution Control Administration, Cincinnati, Ohio.
THE USE OF ULTRAVIOLET ABSORBANCE FOR MONITORING THE TOTAL ORGANIC CARBON CONTENT OF WATER AND WASTEWATER,
Richard A. Dobbs, Robert H. Wise, and Robert B. Dean. May 69, 23p

Descriptors: (*Dissolved organic matter, *Water analysis), Ultraviolet spectra, Absorptivity, Carbon, Monitors.
Identifiers: *Water pollution detection, *Total organic carbon.

The correlation between ultraviolet absorbance at 254 micrometer (A (254 micrometer)) and total organic carbon (TOC) content has been determined for a variety of treated and untreated water samples. These samples ranged from municipal secondary sewage effluent and river water to municipal tap water. High correlation coefficients were obtained for water samples which contained sufficient organic carbon to permit accurate TOC determinations. Predictably, systems with low TOC levels yielded lower correlation coefficients. However, even with the lower correlation coefficients, absorbance measurements can still be used to monitor a process stream for its organic carbon content if interferences from turbidity do not exceed certain limits. (Author)

PB-215 468
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
BIOLOGICAL INVESTIGATION, YAKIMA RIVER, SEPTEMBER, 1961.

28 Feb 62, 11p Working Paper-13
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Yakima River, Biological surveys), (*Washington (State), Water pollution).

As a part of a more comprehensive investigation of the Yakima River, including physical, chemical and biochemical tests, a biological investigation was made. To determine the effects of pollution and the addition of nutrients to the waters of the Yakima River upon the drifting microscopic plants and animals, three nannoplankton samples were collected and analyzed in the laboratory. Collections of bottom fauna, primarily insects, were made at six stations in the Cle Elum to Kiona reach of the main stem Yakima River on September 14 and 21, 1961. The complete record is presented.

PB-215 469
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A STUDY OF NOVEL ION EXCHANGE RESINS AND ELECTRODIALYSIS IN THE REMOVAL OF CONTAMINANTS FROM WASTE WATERS.
Interim rept. 1 Jul 61-30 Jun 62,
John L. Eisenmann, J. Douglas Smith, and Harvey Chew. 1962, 63p
Contract SAph-76690

Descriptors: (*Electrodialysis, *Surfactants), (*Ion exchange resins, Electrodialysis), (*Water treatment, Electrodialysis).
Identifiers: *Benzene sulfonates.

A novel electrodialysis ion exchange resin in particulate form has been developed which displays an alkylbenzene sulfonates sorptive capacity superior to that of any of the presently available commercial ion exchange resins tested. Novel ion exchange membranes have been developed which display porosities superior to those of commercially available ion exchange membranes tested. To a limited extent, these novel membranes permit the passage of large organic molecules, such as ABS, under electrodialytic conditions. Experimentation in the renovation of waste water by means of electrodialysis is shown.

PB-215 470
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
PAYETTE RIVER BASIN (IDAHO), PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.

23 Nov 62, 21p Working Paper-36
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Payette River Basin, *Economic development), (*Idaho, Economic development), River basin development.

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the Payette River Basin, defined to include Payette, Gem, Boise, and Valley Counties, Idaho. The study period is the 50-year period 1960-2010, with an interim point at 1985.

PB-2[illegible] 471
Robin[illegible]e Research Labs., Inc., Berwyn, Pa.
LIQUID ION EXCHANGE IN FOAM PURIFICATION.
Final rept.,
Sallie A. Fisher. 15 Apr 64, 33p
Contract PH-86-63-93

Descriptors: (*Sewage treatment, *Flotation), (*Industrial waste treatment, *Flotation), Ion exchange resins.
Identifiers: *Bubble separation, *Water pollution control.

The report discusses a project undertaken to screen commercially available water insoluble liquid ion exchange material to determine their efficacy as scavangers for small amounts of organic materials in water using a foaming technique. These materials (anionic, cationic were atomized at low levels into the gas used to produce a foam. A total of 12 water-insoluble liquids containing different types and degrees of ionic functionality were screened for their ability to remove phenols. Among the materials tested, the greatest efficiency was found with the use ofDuomeen TMO, Tallow 1, 3 propylamine diamine monoleate.

PB-215 472
Public Health Service, Kansas City, Mo. mMissouri Drainage Basin Office.
LOWER MISSOURI RIVER BASIN WATER POLLUTION INVESTIGATION. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.

Oct 52, 192p PHS-Pub-269, PHS-WPS-47
Prepared in cooperation with the Departments of Health of Iowa, Nebraska, Minnesota and South Dakota, the Missouri Division of Health, and the Kansas Board of Health.

Descriptors: (*Missouri River Basin, *Water pollution), (*Nebraska, Water pollution), (*Missouri, Water pollution), (*Kansas, Water pollution), (*South Dakota, Water pollution).

The Lower Missouri Basin encompasses that region drained by the Missouri River and minor tributaries between the Niobrara and the Mississippi Rivers. The area is about 640 miles in length, 140 miles in maximum width, and 40,970 square miles in area, including parts of the States of Iowa, Kansas, Minnesota, Missouri, Nebraska, and South Dakota. The region considered in this report generally has sufficient water for most uses, and frequently has too much water. The land and water resources conservation program will retain flood flows for beneficial use and, with ultimate development, will control and increase discharge in the Missouri River during periods of low flow. A study of sources of pollution and their effects on the main stem of the Missouri River as detected by physical, chemical, biochemical and bacteriological tests is reported.

PB-215 473
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A CRITICAL REVIEW OF THE LITERATURE OF 1957 ON WATER POLLUTION,
M. B. Ettinger, W. M. Ingram, P. W. Kabler, M. Katz, and F. W. Kittrell. Jan 58, 86p

Descriptors: (*Water pollution, *Reviews), Bibliographies.

A review of 1957 literature is presented on the following topics related to water pollution: Biology; Microbiology; Chemistry; Oxygen sag and stream self-purification; Stream studies and surveys; Stream standards; Effects on water supplies; Abatement and control.

PB-215 474
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
SOUTH PLATTE RIVER BASIN RIVER MILEAGE INDEX.
Sep 66, 34p PR-1

Descriptors: (*Platte River Basin, Metrology).

The publication provides a method of indexing points along the main-stem South Platte River and its tributary streams. The objectives were a single procedure for the identification of point locations pertinent to data collection and a single coding system for the identification of specific parameters of water quality. The first part consists of main-stem and tributary stream mileages and includes important hydraulic features within the study area. The second part gives the river mileage locations of all established communities and cities in the State of Colorado within the confines of the South Platte River Basin.

PB-215 475
Manhattan Coll., Bronx, N. Y. Dept. of Civil Engineering.
THE EFFECT OF SEWAGE AND WASTE CHARACTERISTICS ON OXYGEN TRANSFER COEFFICIENTS.
Final rept.,
W. W. Eckenfelder, Jr., and E. L. Barnhart. Oct 72, 71p
Grant PHS-RG-4694

Descriptors: (*Aeration, *Mass transfer), (*Dissolved gases, Mass transfer), Oxygen, Solubility.

The report describes a series of experiments on the measurement of the overall oxygen transfer coefficient and the liquid film coefficient in solutions of surface active materials. Methods for measuring dissolved oxygen under test conditions and the procedures determining the liquid film coefficient, (K sub L), are described. A study of the effect of temperature on the overall oxygen transfer coefficient and the liquid film coefficient is presented. The effect of this temperature in various concentrations of an organic acid was also evaluated. (Author)

PB-215 476
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
PEND OREILLE BASIN (IDAHO-WASHINGTON) PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.
30 Nov 62, 10p Working Paper-37
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Pend Oreille River Basin, *Economic development), (*Washington (State), Economic development), (*Idaho, Economic development), River basin development.

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the subject area. The Pend Oreille Basin, for the purposes of this study, is defined to include Bonner County, Idaho and Pend Oreille County, Washington. The study period is the 50-year period 1960-2010, with an interim point at 1985. The study is intended only as a preliminary estimate of the outlook for the subject area's growth. The second study is intended for use particularly in assessing future water needs. Emphasis has been placed on the analysis of those industries which make heavy demands upon the water resource. The study is oriented to a specific project and is intended for sizing purposes.

PB-215 477
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
TRENDS IN LAND USE IN THE UMPQUA BASIN, OREGON.
9 Jan 63, 12p Working Paper-40
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Umpqua River Basin, *Land use), (*Oregon, *Water pollution), Trends, Columbia River Basin.

Contents:
Land classification;
The situation on forest land and in forest products;
The situation on cropland;
Pollution problems and forecasts.

PB-215 478
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
TRENDS IN LAND USE IN THE WILLAMETTE VALLEY, OREGON.
23 Jan 63, 18p Working Paper-41
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River Basin, *Land use), (*Oregon, *Water supply), Trends, Columbia River Basin.

The report presents forecasts of agricultural, forestry, and recreational uses of land that will effect water supplies in the Willamette River Basin.

PB-215 479
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
MODIFICATIONS OF THE ACTIVATED SLUDGE PROCESS FOR NITRIFICATION AND DENITRIFICATION,
M. C. Mulbarger. Aug 70, 27p

Descriptors: (*Sewage treatment, Nitrogen), (*Activated sludge process, Nitrogen), (*Chemical removal (Sewage treatment), *Nitrogen), (*Nitrification, Activated sludge process).
Identifiers: *Denitrification.

Several modifications of the activated sludge process incorporating single, dual and three sludge systems were evaluated for nitrification and denitrification in a 0.2 mgd pilot plant. Results indicate that the three sludge system provides the most dependable, consistent operation although it is slightly more expensive in capital costs. Preliminary results of nitrification and denitrification rate dependence upon temperature, design considerations, oxygen uptake rates, surface overflow rates, and solids production rates are presented and discussed. (Author)

PB-215 480
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE DETERMINATION OF CHLORINE DIOXIDE IN TREATED SURFACE WATERS,
Mildred A. Post, and W. Allan Moore. 1973, 22p

Descriptors: (*Chlorine oxides, *Water analysis), (*Colorimetric analysis, Chlorine oxides), Spectroscopic analysis, Disinfectants.
Identifiers: *Naphthalene disulfonic acid/amino-hydroxy.

Approximately one hundred twenty water treatment plants in the United States and Canada now use chlorine dioxide, usually in combination with chlorine, for sterilization purposes. Current methods for the determination of chlorine dioxide either do not make a distinction between this compound and other forms of chlorine or are not sufficiently sensitive at low concentrations. The report describes a technique using 1-amino-8-naphthol-3,6 disulfonic acid to colorimetrically measure ClO2.

PB-215 481
Public Health Service, Portland, Oreg. Div of Water Supply and Pollution Control.
WATER QAULITY STUDIES, BROWNLEE RESERVOIR, SNAKE RIVER.
Summary Report.

1961, 71P Working Paper-16
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Brownlee Reservoir, *Water pollution), (*Snake River, Water pollution), (*Reservoirs, *Water quality).
Identifiers: *Water quality data.

On August 30, 1961, a limnological survey of Brownlee Reservoir on the Snake River was conducted. There was serious concern evidenced as to the water quality of Brownlee Reservoir and its affects on fish and aquatic resources in these waters. The results of the initial survey indicated oxygen depletion in portions of the reservoir, and that further follow-up surveys were needed to properly evaluate the extent of the problem.

PB-215 482
National Center for Air Pollution Control, Cincinnati, Ohio.
ADDENDUM TO SPECIFICATIONS FOR INCINERATOR TESTING AT FEDERAL FACILITIES.

6 Dec 67, 32p

Descriptors: (*Incinerators, Air pollution), (*Air pollution, Particles), (*Particles, Sampling).
Identifiers: *Air pollution detection.

The following material is supplied as a supplement to the publication, 'Specifications for Incinerator Testing at Federal Facilities.' An alternative method for determining particulate emissions, which has the same stringency as the present method based on carbon dioxide measurements, but permits simpler, less expensive, sampling procedures, may be followed if tester so desires. The techniques and requirements are presented.

PB-215 483
National Center For Air Pollution Control, Washington, D.C.
POWELL COUNTY, MONTANA AIR POLLUTION ABATEMENT ACTIVITY. PRE-CONFERENCE INVESTIGATIONS.

Jul 67, 49p

Descriptors: (*Montana, *Air pollution), (*Fluorides, Air pollution), Industrial wastes.
Identifiers: *Powell County (Montana), Garrison (Montana), *Phosphate industry.

The report discusses the air pollution problem of Powell County, Montana. The following topics are discussed. Rocky Mountain Phosphates, Inc. - process and emissions; Fluoride emission control technology; Topography and climatology of Garrison area; and Distribution of fluoride in Garrison area.

PB-215 484
Department of Health, Education and Welfare, Washington, D.C.
SUMMARY OF CONFERENCE AND CONCLUSIONS AND RECOMMENDATIONS ON INTERSTATE AIR POLLUTION NEW YORK--NEW JERSEY METROPOLITAN AREA.

Jan 67, 37p

Descriptors: (*Air pollution, *New York), (*Air pollution, *New Jersey).

The paper presents recommendations made for abatement of the air pollution in the New York-New Jersey metropolitan area. Specific recommendations are given for control of sulfur dioxide emissions, sulfur compounds, and carbon monoxide emissions.

PB-215 485
National Air Pollution Control Administration, Washington, D.C.

GUIDELINES FOR THE DEVELOPMENT OF AIR QUALITY STANDARDS AND IMPLEMENTATION PLANS.
May 69, 62p
Report of the Committee on Public Works, United States Senate, July 15, 1967.

Descriptors: (*Air pollution, *Regulations), (*State government, Air pollution).

The Air Quality Act of 1967 (Public Law 90-148) provided for an intergovernmental system for the prevention and control of air pollution on a regional basis. To put this system into operation, the Department of Health, Education, and Welfare must designate air quality control regions and issue air quality criteria and reports on control techniques. State governments then are expected to establish air quality standards for the air quality control regions and to adopt plans for implementation of the standards. The purpose of this document is to furnish State governments guidance in performing the functions assigned to them under the Act.

PB-215 486
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN MILWAUKEE INTRASTATE AIR QUALITY CONTROL REGION.
Jun 69, 50p APTD-1188

Descriptors: (*Air pollution, *Wisconsin).
Identifiers: *Milwaukee (Wisconsin), *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the Milwaukee, Wisconsin metropolitan area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 487
National Center for Air Pollution Control, Cincinnati, Ohio.
INTERSTATE AIR POLLUTION STUDY PHASE II PROJECT REPORT. VIII. A PROPOSAL FOR AN AIR RESOURCE MANAGEMENT PROGRAM,
J. D. Williams, G. Ozolins, J. W. Sadler, and J. R. Farmer. May 67, 140p

Descriptors: (*Air pollution, *Regional planning), (*Missouri, Air pollution), (*Illinois, Air pollution), Standards.
Identifiers: *Saint Louis (Missouri), *Air pollution standards.

This report is devoted to the development of air-use plans for each of the major air pollutants found in the St. Louis urbanized area. An air-use plan may be thought of as a link between the pollutant emissions of a community and the air-quality goals. The overall function of these plans is to optimize the use of the air by considering the amounts, configurations, and locations of the sources and the dilution capability of the air basin. The air-use plans may be used as the basic framework for achieving the desired air quality by such means as limiting the emissions from individual sources, limiting the emissions from sources in certain areas, or even disallowing new pollutant sources in overburdened areas. The air-use plans thus provide the bases for enacting control regulations and serve as a guide for future planning activities.

PB-215 488
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
EFFECTS OF THE SAN JOAQUIN MASTER DRAIN ON WATER QUALITY OF THE SAN FRANCISCO BAY AND DELTA.

Jan 67, 148p

Descriptors: (*San Joaquin Valley, *Drains), (*California, Channels (Waterways)), Irrigation, Drainage.
Identifiers: *Water pollution control.

The U. S. Bureau of Reclamation and the California Department of Water Resources jointly plan to construct a master drain in the San Joaquin Valley for the purpose of collecting and transporting highly saline agricultural drainage waters to a disposal point in the Sacramento - San Joaquin Delta near the City of Antioch. While there is general agreement that such a drainage project will be required to permit the important agricultural economy of the San Joaquin Valley to continue to prosper, there is less agreement as to the resulting effects on the quality of Delta and San Francisco Bay waters of this plan for disposal. The investigation was limited in duration and was completed in December 1966. The report summarizes the findings of that investigation.

PB-215 489
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
A SURVEY OF CALIFORNIA COASTAL POWER PLANTS,
Robert W. Zeller, and Robert L. Rulifson. Jan 70, 69p

Descriptors: (*Electric power plants, *Pollution), (*Environmental surveys, Electric power plants), (*California, Electric power plants), Air pollution, Water pollution, Thermal power plants, Nuclear power plants, Coasts.

In California there is no provision for regulatory agency consultation on environmental effects during preliminary site selection, a critical stage of thermal power development. After site selection, the California State Resources Agency requires pre- and post-construction field surveys. The purpose of these surveys is to facilitate development of waste heat discharge requirements, and document environmental changes due to heated discharges and the possible need for changes in discharge requirements. The report contains the findings of one survey of ten power facilities.

PB-215 490
Sanitary Engineering Center, Cincinnati, Ohio.
A BRIEF LITERATURE SURVEY ON THE TOXICITY OF CYANIDES IN WATER,
James P. Sheehy. 1952, 25p

Descriptors: (*Cyanides, *Toxicology), (*Water pollution, Cyanides).
Identifiers: *Water pollution effects (Animals).

A review is made of the toxicity of cyanides to man and animals, with particular attention to solutions of cyanides.

PB-215 491
Environmental Health Center, Cincinnati, Ohio.
DETERMINATION OF THE TOXICITY OF TRIVALENT AND HEXAVALENT CHROMIUM ON THE OXYGEN UTILIZATION OF SEWAGE.
H. L. Krieger, and W. Allan Moore. 1949, 9p

Descriptors: (*Chromium, *Sewage treatment), (*Biochemical oxygen demand, *Trace elements).

Although the toxic effect of a metal such as chromium on the normal B.O.D. of domestic sewage has been discussed before, sufficient information was desired in order to make a comparison of the oxygen utilization of the sewage without the chromium salts with those of increasing concentrations of chromium salts in terms of p.p.m. of dissolved oxygen depletions. The toxicity of both hexavalent and trivalent chromium has been observed in this experiment. The trivalent form showed the more consistent inhibition as the chromium concentration was increased. The hexavalent chromium reached a plateau in its effect on the B.O.D. of sewage when its concentration was 3.0 p.p.m., and further increases to 10 p.p.m. had no significant effect on the inhibition.

PB-215 492
Department of Health, Education and Welfare, Washington, D. C.
PROGRESS EVALUATION MEETINGS IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE MISSOURI RIVER, OMAHA, NEBRASKA AREA (NEBRASKA-IOWA-MISSOURI-KANSAS) HELD IN OMAHA, NEBR., 27 JAN 66 AND 29 MAR 66. TRANSCRIPT OF PROCEEDINGS,
Murray Stein. 1966, 127p

Descriptors: (*Missouri River, *Water pollution), (*Nebraska, Water pollution).
Identifiers: *Omaha (Nebraska).

The report contains transcripts of meetings held to discuss the water pollution problem of Omaha, Nebraska and its abatement.

PB-215 493
Public Health Service, San Francisco, Calif. Region IX.
RUSSIAN RIVER BASIN, CALIFORNIA. PRELIMINARY REPORT ON FUTURE MUNICIPAL AND INDUSTRIAL WATER USES AND FUTURE WATER QUALITY CONTROL FLOWS.

Mar 63, 87p

Descriptors: (*Russian River Basin, *Water resources), (*California, *Water resources), Water consumption, Trends.

The purpose of the report is to present the results of a preliminary study of future needs and uses of the water resources of the Russian River Basin. Specific objectives for the study are as follows: Estimate future municipal and industrial water supply requirements in - The Russian River Basin; Probable market areas outside the Russian River Basin in Marin, Sonoma, Napa and Solano Counties; Estimate the need for storage for the regulation of flows for the purpose of water quality control in the Russian River.

PB-215 494
Federal Water Quality Administration, Washington, D. C.
FEDERAL GUIDELINES - DESIGN, OPERATION AND MAINTENANCE OF WASTE WATER TREATMENT FACILITIES.
Sep 70, 50p

Descriptors: (*Sewage treatment, Standards), Sewers, Regulations.

The paper contains guidelines intended to supplement existing references such as the Recommended Standards for Sewage Works: Great Lakes-Upper Mississippi River Board of State Sanitary Engineers (the Ten State Standards), the ASCE Manuals Number 36 and 37 (WPCF Manuals 8 and 9), and applicable State standards and guidelines. All water pollution control projects which are submitted for FWQA construction grants will be required to conform to these Guidelines and future Technical Bulletins, as well as to applicable State requirements.

PB-215 495
Sonoma County Sanitation Dept., Calif.
EVALUATION OF EXTERNAL SEALING METHOD TO REDUCE STORM FLOW EFFECTS INSEWERAGE SYSTEMS.
Final progress rept.,
Donald B. Head. 1968, 121p

Grant WPD-111-01-66
See also Appendix PB-216 237.

Descriptors: (*Sewers, *Sealing), (*Fluid infiltration, Sewers), (*Overflows, Fluid infiltration).
Identifiers: *Storm water runoff.

Infiltration problems are common to many communities throughout the United States. Designing collection systems which can adequately collect and transport sanitary sewage depends not only on the quantity of sanitary sewage to be handled but also upon the quantity of storm and ground water infiltration which must be anticipated. The report is confined to the sealing of sanitary sewage collection systems. It is the intent of the study and report to describe the use of an external application of asphaltic sealants in several different localities. By actually sealing leaking lines in areas of differing soil characteristics and in systems which employ differing pipe and jointing methods, it has been possible to include a sufficient variety of conditions to approximate conditions common to many communities in the United States.

PB-215 496
National Center for Air Pollution Control, Cincinnati, Ohio.
INTERSTATE AIR POLLUTION STUDY, PHASE II PROJECT REPORT. V. METEOROLOGY AND TOPOGRAPHY,
D. O. Martin, P. A. Humphrey, and J. L. Dicke.
Apr 67, 47p
See also report Dated Dec 66, PB-215 508.

Descriptors: (*Air pollution, *Missouri), (*Air pollution, Illinois), Meteorology.
Identifiers: *Saint Louis (Missouri).

The report contains meteorological and topographical aspects of the Interstate Air Pollution Study, a general study of the overall air pollution problems in the St. Louis - East St. Louis Metropolitan area.

PB-215 497
Federal Water Quality Administration, Portland, Oreg. Northwest Region.
AN EVALUATION OF SALMONID HATCHERY WASTES,
Danforth G. Bodien. Oct 70, 53p

Descriptors: (*Aquaculture, *Industrial waste treatment), (*Water pollution, *Industrial wastes), Salmon, Oregon.
Identifiers: *Fish hatcheries, *Water pollution control.

The study area included the States of Idaho, Oregon, Washington and western Montana. Primary attention was given to four hatcheries which were selected as representative of hatcheries in the study area, Eagle Creek National Fish Hatchery, near Estacada, Oregon; Abernathy Creek Salmon Cultural Laboratory, near Longview, Washington; Little White Salmon National Fish Hatchery, near White Salmon, Washington; and Dworshak National Fish Hatchery at Asahka, Idaho. The objectives of the study were to determine total waste load, waste characteristics, and methods for controlling fish hatchery wastes.

PB-215 498
Environmental Health Center, Cincinnati, Ohio.
PERSISTENCE OF MONO-CHLOROPHENOLS IN POLLUTED RIVER WATER AND SEWAGE DILUTIONS,
M. B. Ettinger, and C. C. Ruchhoft. 10 Jun 50, 11p
Presented at the Central States Sewage Works Association Annual Meeting, Indianapolis, Indiana, June 9-10, 1950.

Descriptors: (*Phenols, *Biodeterioration), (*Chlorine aromatic compounds, Biodeterioration), (*Water pollution, Phenols), Sewage.
Identifiers: *Phenol/chloro, *Self purification.

It has been shown that low concentrations (1,000 p.p.b.) of ortho and para-chlorophenol, when added to the ordinary dilutions of domestic sewage, were not always removed in periods of 20 to 30 days at 20C. Similar concentrations of these mono-chlorophenols were removed at this temperature during similar periods of storage when added to polluted surface waters. These observations on the conditions required for the dissipation of mono-chlorophenols in surface waters and sewage dilutions along with previous observations on the similar dissipation of cresols and phenol indicate that biochemical dissimilation is responsible for the removal of these materials. The study has also shown that the removal of these mono-chlorophenols requires the presence of a specialized microflora.

PB-215 499
Federal Water Pollution Control Administration, Edison, N.J. North Atlantic Water Quality Management Center.
EVALUATION OF MACERATOR-CHLORINATORS ON U.S. COAST GUARD VESSELS.

Jun 68, 51p CWT-10-1

Descriptors: (*Sewage treatment, *Ships), Disinfection, Chlorination, Grinders.
Identifiers: *Shipboard sewage treatment systems.

The North Atlantic Water Quality Management Center undertook an investigation to evaluate the operation of the Carlson, C-Chlor, Mark 10, macerator-chlorinator unit installed aboard U. S. Coast Guard vessels in the New York area. The treatment facilities were installed by the Coast Guard in accordance with a schedule agreed upon by FWPCA. The investigating program, which was dependent upon vessel availability, was designed to: Test the units under actual operating conditions, specially during maximum use periods when detention time in the macerator would be at a minimum; Determine the mechanical reliability of the treatment device; Ascertain the degree of treatment provided and the effectiveness of the system in reducing pollution.

PB-215 500
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT ON BACTERIOLOGICAL POLLUTION FROM MUNICIPAL AND INDUSTRIAL WASTE DISCHARGES ON THE RED RIVER OF THE NORTH.

Feb 66, 62p
Errata sheet inserted.

Descriptors: (*Red River of the North, *Water pollution), (*Minnesota, Water pollution), (*North Dakota, Water pollution), Bacteria, Sewage.
Identifiers: *Water quality data.

On September 14, 1965, a Conference attended by representatives of the states of Minnesota and North Dakota and Department of Health, Education, and Welfare was held to evaluate the effects of pollution on the interstate waters of the Red River of the North, and to recommend abatement action if such pollution could be demonstrated. The representative of North Dakota expressed a desire to ascertain the degree of bacteriological pollution from each of the sources listed in the Federal report, and recommended further study to pinpoint the extremely high bacterial densities in the river, so that effective remedial action might be taken. The request resulted in the bacteriological survey presented here.

PB-215 501
National Center for Urban and Industrial Health, Cincinnati, Ohio.
WATER CYANIDES NUMBER 1.
Environmental health series,
Raymond J. Lishka, Laurella A. Lederer, and Earl F. McFarren. 1967, 55p PHS Pub-999-UIH-4, PHS-ARS-Study-29
Report of a study conducted by the Analytical Reference Service.

Descriptors: (*Cyanides, *Water analysis), Standards, Accuracy.
Identifiers: *Water pollution detection.

The objective of the study was to evaluate the ability of the distillation, titrimetric, and colorimetric procedures offered in Standard Methods to quantitatively measure both simple and complex cyanides in water. In the study each participant was shipped three concentrated solutions in sterile, sealed, glass ampoules. On receipt they were instructed to dilute 5 ml of each sample to 1 liter with a good qaulity distilled water and to analyze each sample to 1 liter with a good quality distilled water and to analyze each sample by each of two standard methods, copies of which were provided. In view of the drinking water limitation of 0.01 mg per liter of cyanide, these results indicate the need for an improved method.

PB-215 502
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A CRITICAL REVIEW OF THE LITERATURE OF 1956 ON WATER POLLUTION,
M. B. Ettinger, W. M. Ingram, P. W. Kabler, F. W. Kittrell, and R. Porges. Feb 57, 74p

Descriptors: (*Water pollution, *Reviews).

The report reviews the following subjects related to water pollution: Biology, Stream chemistry, Microbiology; Stream self-purification, and Abatement and control techniques.

PB-215 503
Public Health Service, Portland, Oreg. Region IX.
TOXICITY IN THE AQUATIC ENVIRONMENT,
Edward F. Eldridge. Nov 61, 133p
Proceedings of the Pacific Northwest Symposium on Water Pollution Research (10th) Held in Portland, Oreg., 14 Nov 61.

Descriptors: (*Toxicology, *Water pollution), (*Public health, Water pollution), Aquatic animals, Insecticides, Pesticides, Metals, Pulpwood, Mills, Nuclear power plants, Plants (Botany), Agriculture, Food chains, Shellfish, Fisheries, Bioassay, Research, Proceedings.
Identifiers: *Water pollution effects (Animals).

Contents:
- Pesticides, Public health service studies;
- Toxicity of insecticides to fish in the northwest;
- Toxicity of metals and their detection;
- Pulp mill wastes vs. oysters;
- Process wastes from atomic energy operations;
- Toxicity vs. agricultural plants and soils;
- The shellfish toxin problem;
- Toxicity bioassays vs. chemical methods.

PB-215 504
Environmental Control Administration, Cincinnati, Ohio. Analytical Reference Service.
WATER FLUORIDE NUMBER 3.
Earl F. McFarren, B. J. Moorman, and J. H. Parker. 1969, 71p PHS-Pub-1895, PHS-ARS-Study-33

Descriptors: (*Water analysis, *Fluorides), Potentiometric analysis, Ion exchanging, Accuracy, Comparisons.
Identifiers: *Water pollution detection, *Ion selective electrodes.

The constantly increasing number of communities fluoridating their water supplies has made the measurement of fluoride a routine analysis in many laboratories. Since strict control of the con-

centration of fluoride is required, and most of the currently used methods of analysis are sensitive to interferences commonly encountered in surface waters, better methods of analysis have been sought. It was determined that at least two were worthy of collaborative study: the fluoride electrode and the ion-exchange methods. The lanthanum alizarin complexone method also was investigated and found to be useful for high salinity waters but not for ordinary waters. In this report the results obtained on analysis of three water samples for fluoride by an electrode method, an ion-exchange method and a modified electrode method are compared.

PB-215 505
Trenton City Engineering Dept., Mich.
PHOSPHATE REMOVAL BY BIOLOGICAL PROCESS.
Final rept. 1 Feb 67-31 May 69,
Timothy L. Hennessey. 31 May 69, 35p

Descriptors: (*Sewage treatment, Phosphorus), (*Chemical removal (Sewage treatment), *Phosphorus), (*Activated sludge process, Phosphorus).

The purpose of the Pilot Plant installed at the City of Trenton was to establish the efficacy of removing phosphorous from waste water using a biological system. The project was initiated on February 1, 1967 and continued through to May 31, 1969. The major activities of this project were, the design and fabrication of the two 10 gpm activated sludge process uinits; the determination of the operating parameters which result in phosphorous removal and the operation of continuous flow through system utilizing acid stripping modification of conventional activated sludge for phosphorous removal. (Author)

PB-215 506
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PROCEEDINGS OF THE 1961 SYMPOSIUM ON GROUND WATER CONTAMINATION HELD IN CINCINNATI, OHIO, 5-7 APR 61.
1961, 223p SEC-TR-W61-5

Descriptors: (*Water pollution, *Ground water), Meetings.

The report is a compilation of papers presented at a symposium relative to ground water contamination and include topics on hydrogeological aspects of contamination, the types of contaminants, and regulations and contamination control methods.

PB-215 507
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
INTERSTATE AIR POLLUTION STUDY, PHASE II PROJECT REPORT. VII. OPINION SURVEYS AND AIR QUALITY STATISTICAL RELATIONSHIPS,
J. D. Williams, and F. L. Bunyard. May 66, 44p
See also report dated Dec 66, PB-215 508.

Descriptors: (*Air pollution, *Public opinion).
Identifiers: *Saint Louis (Missouri).

The report covers opinion surveys and air quality statistical relationships related to air pollution problems in the St. Louis - East St. Louis Metropolitan area.

PB-215 508
National Center for Air Pollution Control, Cincinnati, Ohio.
INTERSTATE AIR POLLUTION STUDY, PHASE II PROJECT REPORT. VI. EFFECTS OF AIR POLLUTION,
J. D. Williams, F. D. Maddox, T. O. Harris, C. M. Copeley, Jr., and W. Van Dokkenburg, Jr. Dec 66, 66p
See also report dated May 66, PB-215 507.

Descriptors: (*Air pollution, *Missouri), (*Air pollution, *Illinois), Atmospheric corrosion, Public health.
Identifiers: *Air pollution effects (Materials), *Air pollution effects (Animals), *Air pollution effects (Plants), *Saint Louis (Missouri).

The report describes an analysis of air pollutant effects on public health, vegetation, materials, and property values in the St. Louis Metropolitan Area.

PB-215 509
Federal Water Quality Administration, Portland, Oreg. Northwest Region.
EXAMINATION OF THE WASTE TREATMENT AND DISPOSAL OPERATIONS AT THE NATIONAL REACTOR TESTING STATION, IDAHO FALLS, IDAHO.

Apr 70, 111p

Descriptors: (*Nuclear reactors, *Industrial waste treatment), Idaho.
Identifiers: *Water pollution control, *Idaho Falls (Idaho), *National Reactor Testing Station.

Representatives of the Federal Water Quality Administration and the Idaho Department of Health made an examination of the waste treatment and disposal practices at the National Reactor Testing Station (NRTS) near Idaho Falls, Idaho, during the period October 15 to 22, 1968. The purpose of the examination was to review and evaluate the existing waste management operations to determine whether any additional water pollution control systems or procedures are necessary or desirable to carry out the national policy to improve water quality. (Author Modified Abstract)

PB-215 510
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN PITTSBURGH INTRASTATE AIR QUALITY CONTROL REGION.

Feb 69, 64p APTD-1222

Descriptors: (*Air pollution, *Pennsylvania).
Identifiers: *Air quality data, *Pittsburg (Pennsylvania).

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the metropolitan Pittsburg area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 511
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
DETERMINATION OF FORMALDEHYDE BY THE CHROMOTROPIC ACID METHOD,
Aubrey P. Altshuller, David L. Miller, and Stanley F. Sleva. 1960, 23p

Descriptors: (*Formaldehyde, *Colorimetic analysis), (*Gas analysis, Formaldehyde).
Identifiers: *Air pollution detection, *Naphthalene disulfonic acid/dihydroxy.

Large quantities of formaldehyde are produced both by combustion sources such as automobile exhaust and by photooxidation reactions in the atmosphere. It has been suggested that formaldehyde is likely to be a factor in eye irritation by Los Angeles type smog. Consequently, there is much interest in the accurate microdetermination of formaldehyde in the atmosphere. One reagent proposed for the analysis of formaldehyde is chromotropic acid (1,8-dihydroxynaphthalene-3,6-disulfonic acid). The report discusses the use of this substance for the purpose.

PB-215 512
Federal Water Pollution Control Administration, Washington, D.C.
FIELD DATA SUMMARY: BOSTON HARBOR - CHARLES RIVER STUDY MASSACHUSETTS,
C. E. Runas, and L. A. Resi. Feb 68, 99p

Descriptors: (*Boston Harbor, *Water pollution), (*Massachusetts, Water pollution), (*Charles River, Water pollution).
Identifiers: *Water quality data.

The summary of data on the quality of water of the Charles River, Boston Harbor, and selected tributaries to Boston Harbor is based on information obtained in the July-August 1967 field investigation. The study was made for the New England River Basins Comprehensive Program specifically to provide data to be used in their development of a mathematical model and report on water quality in the Charles River-Boston Harbor complex. It is anticipated that the model, when functional, can identify pollution problems, water uses impaired, and provide the framework for possible solutions to the problems.

PB-215 513
Department of Health, Education and Welfare, Washington, D.C.
PROGRESS EVALUATION MEETING ON THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE MISSOURI RIVER IN THE KANSAS CITYS METROPOLITAN AREA. TRANSCRIPT OF PROCEEDINGS OF CONFERENCE HELD 21 APR 65 AT CONTINENTAL HOTEL, KANSAS CITY, MISSOURI AND APPENDED SUMMARY OF CONFERENCE, 3 DECEMBER 1957.

30 Jun 60, 81p

Descriptors: (*Missouri River, *Water pollution), (*Kansas, Water pollution), (*Missouri, Water pollution).
Identifiers: *Kansas City Metropolitan Area.

The report presents the text of a hearing on Kansas City's inability to keep from polluting the Missouri River with their sewage discharges.

PB-215 514
Federal Water Pollution Control Administration, Edison, N.J. Hudson-Delaware Basins Office.
AN EVALUATION OF THE SIGNIFICANCE OF COMBINED SEWER OVERFLOWS IN THE HUDSON RIVER ENFORCEMENT CONFERENCE AREA.

Jun 69, 71p CWT-10-11

Descriptors: (*Hudson River, *Water pollution), (*Overflows, Water pollution), (*Combined sewers, Water pollution).

Overflows from combined sewer collection systems can create pollution problems. The purposes of the study are to review briefly the work already done and assess the problem as it relates to the Hudson River Conference Area and offer suggestions to the conferees regarding a solution to the problem.

PB-215 515
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A CRITICAL REVIEW OF THE LITERATURE OF 1955 ON WATER POLLUTION,
M. B. Ettinger, C. Henderson, A. Hirsch, P. Kabler, and M. Katz. Feb 56, 75p

Descriptors: (*Water pollution, *Reviews).

The report reviews the following topics concerned with water pollution: Aquatic biology; Stream self-purification; Aquatic microbiology; and Water pollution control.

PB-215 516
Bechtel Corp., San Francisco, Calif.
COST ESTIMATING GUIDELINES FOR WASTEWATER TREATMENT SYSTEMS.
Jul 70, 102p FWQA-ORD-17090/DRU-07/70
Contract DI-14-12-582

Descriptors: (*Sewage treatment, *Cost estimates), Capitallized costs, Operating costs, Financing, Cost factors.

The manual provides guidelines for the cost estimator concerned with various wastewater treatment systems. Direction is given for the uniform presentation of capital and annual cost data now being developed. Individual sections deal with suggested forms for submitting reports, including an outline, and method and format for preparing capital and annual cost estimates for Federal Water Quality Administration (FWQA) studies. The following specific data are appended: Summary of cost indices useful in scaling capital costs of previous years to present; Description of typical operating cost data; sources of additional data; Discussion of municipal bonds and financing; Discussion of levels of estimates and expected accuracies.

PB-215 517/4
Pacific Northwest Water Lab., Corvallis, Oreg.
PROCEEDINGS: NATIONAL SYMPOSIUM ON FOOD PROCESSING WASTES (2ND), DENVER, COLORADO, 23-26 MARCH 1971.
Water pollution control research series.
Mar 71, 654p EPA-12060-03/71
Paper copy available from GPO $4.50 as stock no. 5501-0167.

Descriptors: (*Water pollution, *Food industry), (*Food processing, *Industrial waste treatment), Canneries, Dairy products, Livestock, Shellfish, Lagoons (Ponds), Activated sludge process, Dehydrators, Trickling filtration, Brines, Waste disposal, Air pollutions, Meetings.
Identifiers: *Water pollution control, Sugar beet processing, Citrus fruit processing, Potato processing, Fruit processing, Poultry processing, Pea processing, Corn processing, Whey, Biological industrial waste treatment, Liquid waste disposal, Solid waste disposal.

The report discusses air, water, and solid wastes pollution problems, and the solutions taken by various food processing industries such as shellfish, fruit, potato, pea, citrus, meat packing, poultry, cottage cheese, and sugar beet.

PB-215 532/3
American Public Works Association, Chicago, Ill. Research Foundation.
WATER POLLUTION ASPECTS OF URBAN RUNOFF.
Water pollution control series.

Jan 69, 271p FWPCA-11030-DNS-01/69

Descriptors: (*Water pollution, *Surface water runoff), (*Urban areas, Surface water runoff), Solids, Streets, Refuse, Sources, Air pollution, Catch basins, Sewers, Sediments.
Identifiers: *Storm water runoff, Urban hydrology, Water pollution abatement.

Analysis and evaluation of environmental pollution factors and their potential pollutional effects resulting from the water-wastes interfacial contracts during precipitation and runoff. Factors studied included, street refuse and litter, catch basins, environmentally used chemicals, contributions from air pollution and its control, and sewer solids deposition. Street refuse found to be significant to pollution load. Pollution load measured in terms of BOD is estimated in terms of average daily load, and in terms of the shock pollution load on the receiving body of water. Findings and Recommendations are presented in summary form. Comprehensive set of typical ordinances regarding possible sources of pollution included. (Author)

PB-215 545
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ANNUAL REVIEW OF LITERATURE ON RADIOACTIVITY STUDIES OF AIR, WATER AND WASTES, 1955,
Lloyd R. Setter, and A. S. Goldin. Feb 56, 34p

Descriptors: (*Radioactive contaminants, *Reviews), (*Air pollution, Radioactive contaminants), (*Water pollution, Radioactive contaminants), Bibliographies.

Contents:
Radioactivity-Waste treatment and disposal;
Contamination and decontamination;
Surveys;
Effects of nuclear weapons;
Radiochemical methods;
Instrumental methods;
Air pollution;
Biological effects;
Applications of isotopes;
Regulation;
References.

PB-215 546
Environmental Protection Agency, Washington, D.C. Office of Federal Activities.
BASIC DOCUMENTS CONCERNING FEDERAL PROGRAMS TO CONTROL ENVIRONMENTAL POLLUTION FROM FEDERAL GOVERNMENT ACTIVITIES.
1971, 137p

Descriptors: (*Pollution, *Legislation), (*Legislation, *Air pollution), (*Legislation, *Water pollution).

The booklet contains a compilation of documents which have proved useful to the Environmental Protection Agency. The documents, which include legislation, Presidential Executive Orders, and Office of Management and Budget Circulars and Bulletins, fall into three main areas: Environmental impact statements; Control of pollution from federal facilities; Environmental controls in federal agreements (contracts, grants, loans, leases, licenses, and permits, etc.). This compilation is not intended to be an exhaustive catalog of the legal authorities for the Federal government's internal environmental protection programs, but rather a handy reference for those who work with those programs on a daily basis.

PB-215 547
Federal Water Pollution Control Administration, Washington, D. C.
SEWAGE AND WATER WORKS CONSTRUCTION.
1968, 16p

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts).

The data presented are composed of contracts awarded by municipalities, special districts, and other local governmental bodies. A few contracts are included for industries where the cost of such facilities can be readily identified, and where it is possible to ascertain that facilities are primarily for the disposal of sanity wastes or for domestic waterworks facilities.

PB-215 548
Maryland Univ., College Park. Dept. of Chemical Engineering.
THE EFFECT OF SMALL SURFACE WAVES ON INTERFACIAL MASS TRANSFER.
Research rept.,
Kurt Muenz. 1965, 142p
Grant PHS-WP-00323

Descriptors: (*Air water interactions, Mass transfer), (*Dissolved gases, *Mass transfer), Oxygen, Carbon dioxide, Hydrocarbons, Helium, Solubility, Mathematical models.

A quantitative experimental program, to determine the effects of small surface waves on interfacial mass transfer was undertaken. In addition, pertinent mass transfer and hydrodynamic theory is presented and discussed. The particular scheme explored is that of transfer from the gas phase into a liquid (absorption), with water as the liquid throughout all experiments. The substances absorbed were Oxygen, Helium, Carbon Dioxide and Propylene. They were present as essentially pure gases. Small amplitude, progressive two dimensional waves were mechanically generated at the liquid surface. For each system, control experiments with non-waved surfaces were also carried out. Unsteady state runs were made and total gas absorbed was measured with time. (Author)

PB-215 549
National Center for Air Pollution Control, Cincinnati, Ohio.
INTERSTATE AIR POLLUTION STUDY. PHASE II PROJECT REPORT. III. AIR QUALITY MEASUREMENTS,
J. R. Farmer, and J. D. Williams. Dec 66, 191p

Descriptors: (*Air pollution, *Missouri).
Identifiers: *Saint Louis (Missouri), *Air quality data.

The development of an effective air resource management program begins with identification of the pollutants in the air, and determination of the quantity and origin of each type. The air quality measurement program was designed and operated to make these determinations in the Metropolitan St. Louis area. Once the physical aspects of the air pollution problem are defined, air-pollution-effect data and criteria as well as opinion surveys can be used to set the air quality goals. In addition to its use in the air resource management program, the report provides a reasonably complete list of air quality data in a form that will assist research and program personnel in developing activities and attaining program objectives. A population distribution map of the Study area, is provided to allow comparison between distribution of population, pollutants, and sampling measurement networks.

PB-215 550
Dow Industrial Service, Cleveland, Ohio.
EVALUATION OF THE USE OF ACTIVATED CARBONS AND CHEMICAL REGENERATION IN TREATMENT OF SECONDARY SEWAGE PLANT EFFLUENTS.
Final rept. 26 Dec 60-28 Feb 61,
R. L. Johnson, F. J. Lowes, Jr., R. M. Smith, and T. J. Powers. 1961, 63p
Contract SAph-76290

Descriptors: (*Sewage treatment, *Activated carbon treatment), Dissolved organic matter.

The purpose of the investigations described in the report has been threefold: Determine the extent and capacity of carbon to adsorb substances from a municipal sewage which has been subjected previously to conventional methods through the secondary treatment process. Determine if commercially available chemical oxidants can regenerate an activated carbon which has exhaustively adsorbed soluble municipal waste substances. Elaborate on some of the conditions necessary for optimum performance of the best chemical oxidant resulting from a regeneration of exhausted activated carbon screening program.

PB-215 551
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ANNUAL REVIEW OF LITERATURE ON RADIOACTIVITY STUDIES OF AIR, WATER AND WASTES, 1956,
Conrad P. Straub, and Lloyd R. Setter. Mar 57, 49p

Descriptors: (*Radioactive contaminants, *Reviews), (*Air pollution, Radioactive contami-

nants), (*Water pollution, Radioactive contaminants), Bibliographies.

The paper reveiws the literature pertaining to radioactivity in air, water and wastes for 1956. The reviews have included select literature covering the general field of public health with emphasis on water and wastes.

PB-215 552
Federal Water Pollution Control Administration, New York. Region II.
THE EFFECT OF CHANNEL DREDGING ON WATER QUALITY IN THE DELAWARE ESTUARY.
May 66, 11p

Descriptors: (*Dredging, *Delaware estuary), (*Water pollution, Dredging).

The purpose of the study is to determine the effect of several dredging schemes for widening and deepening the navigation channel from Philadelphia, Pa. to the sea on salinity in the estuary. In addition, the effect of channel dredging on dissolved oxygen has been investigated since this parameter is of utmost importance in present and future pollution abatement studies. The area of detailed study is limited to the main stem of the Delaware River between Liston Point, Delaware and Trenton, N.J. (Author Modified Abstract)

PB-215 553
Environmental Health Center, Cincinnati, Ohio.
ANALYSIS OF CYANIDE IN WATER AND WASTE SAMPLES,
F. J. Ludzack, W. A. Moore, and C. C. Ruchhoft.
Mar 53, 18p

Descriptors: (*Cyanides, *Water analysis).
Identifiers: *Water pollution detection.

The presence of cyanide in water has a significant effect upon the biological activity of the system. Most cyanide compounds are highly reactive. The analytical procedures used for their estimation are not specific; therefore the major problem is that of isolation from interferences. Although many procedures for the analysis of cyanide have been published, relatively few of these are satisfactory for general use in water and industrial waste analysis. The procedures described were selected because they are applicable for many types of samples. The methods were found effective on relatively pure water, river water, sewage and several industrial wastes, including those from gas and coke operation, petroleum refining, and plating.

PB-215 554
Environmental Health Center, Cincinnati, Ohio.
APPLICATIONS OF BIOLOGICAL RESEARCH IN THE CONTROL OF INDUSTRIAL WASTES,
Clarence M. Tarzwell, and Peter Doudoroff. 1952, 24p
Published in the Proceedings of the National Technical Task Committee on Industrial Wastes Meeting held at Cincinnati, Ohio, June 3-4, 1952.

Descriptors: (*Water pollution, *Toxicology), Bioassay, Industrial wastes, Fishes.
Identifiers: *Water pollution effects (Animals).

The report describes bioassay methods for determining the severity of water pollution and the effects of the pollution on aquatic life.

PB-215 555
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Community Air Pollution Program.
APPLICATION OF ELECTRONIC PROCESSING TO AIR QUALITY DATA,
Arthur C. Stern. 1957, 15p
Presented at the Semi-Annual Technical Conference, Air Pollution Control Association, Fairmont Hotel, San Francisco, California, November 18-19, 1957.

Descriptors: (*Data processing, *Air pollution).

Because of the large amount of air quality data being accumulated by the National Air Sampling Network (NASN) of the United States Public Health Service, it became evident that electronic processing methods would have to be developed for data interpretation and analysis. When finally developed, it was apparent that these methods would also be useful for analysis of air quality data resulting from air sampling by state and local air pollution control agencies and by research and industrial groups. The purpose of the paper is to describe the forms of computed data output and their interpretation so that other agencies can determine whether this technique would be useful to them.

PB-215 556
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE WASATCH FRONT INTRASTATE AIR QUALITY CONTROL REGION (UTAH).
Apr 70, 44p APTD-1207

Descriptors: (*Utah, *Air pollution).
Identifiers: *Air quality data, *Salt Lake City (Utah).

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of Wasatch Front Intrastate Air Quality Control Region (Utah). The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 557
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY CONTROL STUDY: BURNT RIVER BASIN PROJECT, DARK CANYON DIVISION, OREGON.

Apr 66, 43p

Descriptors: (*Burnt River, *Reservoirs), (*Oregon, *Water resources).
Identifiers: *Baker County (Oregon).

The investigation was conducted to advise the Bureau of Reclamation on the need for and value of storage for water quality control in the Burnt River Project, Dark Canyon Division. The Burnt River drainage basin lies in the southern portion of Baker County, Oregon. Available data on water uses, waste sources, and water quality in the study area were examined, evaluated, and projected. Evaluations are based on projected conditions for periods to 1985 and 2010. The economic base study prepared for this purpose is summarized in the report. (Author)

PB-215 558
Public Health Service, Washington, D.C. Div. of Air Pollution.
REPORT ON INTERSTATE AIR POLLUTION IN THE SELBYVILLE, DELAWARE - BISHOP, MARYLAND, AREA.

Nov 65, 56p

Descriptors: (*Air pollution, *Delaware), (*Air pollution, *Maryland), (*Food processing, Air pollution).
Identifiers: *Rendering plants, *Bishop (Maryland), *Selbyville (Delaware).

The report summarizes the activities undertaken, subsequent to receipt of the Delaware request, by the Abatement Branch, Division of Air Pollution, Public Health Service, Department of Health, Education, and Welfare, along the following lines: Investigation of odors in the Selbyville-Bishop area; Review of available topographical and meteorological information; and Inspection of the plant operated by Bishop Processing Company. (Author)

PB-215 559
Public Health Service, Washington, D.C. Div. of Air Pollution.
REPORT ON INTERSTATE AIR POLLUTION IN THE SHOREHAM, VERMONT - TICONDEROGA, NEW YORK, AREA.

Nov 65, 35p

Descriptors: (*Paper industry, Air pollution), (*Air pollution, *New York), (*Vermont, *Air pollution).
Identifiers: *Ticonderga (New York), *Shoreham (Vermont).

This report summarizes the activities undertaken by the Abatement Branch, Division of Air Pollution, Public Health Service, Department of Health, Education, and Welfare, along the following lines: Inspection of the pulp mill operated by the International Paper Company in Ticonderoga, New York; Review of available topographical and meteorological information; and Calculation of emissions, transport and diffusion of odorous materials from the mill site. (Author)

PB-215 560
Northwestern Univ., Evanston, Ill. Technological Inst.
ECOLOGY OF SPHAEROTILUS IN ACTIVATED SLUDGE.
Annual rept. no. 3,
Wesley O. Pipes. Dec 67, 107p

Descriptors: (*Activated sludge process, *Microorganism control (Sewage)).
Identifiers: *Spaerotilus natans.

Since the inception of the activated sludge process, operating problems have been associated with the growth of excessive numbers of filamentous organisms in the sludge. Since separation of the activated sludge from the effluent by sedimentation is absolutely essential for obtaining proper operation of the process, anything which interfers with the settling of the sludge produces a serious operating problem. Any problem with separation of activated sludge in the secondary settling tank, particularly if large concentrations of sludge solids are being lost into the effluent, may be called 'bulking.' Most of the descriptions of bulking ascribe its cause to an overgrowth of a particular filamentous organism, Sphaerotilus natans. The objective of the research described was to provide data which will serve as a basis for quantitative description of some of the phenomena which produce an activated sludge which separated poorly, to determine which filamentous organisms are associated with which phenomena, and to identify environmental factors in the process which could cause the occurrence of each phenomenon.

PB-215 561
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
PLYWOOD PLANT GLUE WASTES DISPOSAL.
Progress rept.,
Danforth G. Bodien. Feb 68, 56p PR-2

Descriptors: (*Glue, *Industrial waste treatment), (*Plywood, Industrial waste treatment).
Identifiers: *Water pollution control, *Wood processing industry.

In the States of Oregon, Washington, Idaho, Montana, and California, 158 plywood plants generate

an estimated 6.2 million gallons of waste per day from the cleanup of glue mixing equipment and glue spreaders. The waste is toxic and high in pollutional strength. Treatment of these glue wastes varies from plant to plant but generally consists only of solids separation or the removal of suspended matter. The report presents continuing research on the treatment and disposal of the waste.

PB-215 562
Federal Water Pollution Control Administration, College, Alaska. Alaska Water Lab.
EFFECTS OF PLACER MINING ON WATER QUALITY IN ALASKA.

Feb 69, 88p

Descriptors: (*Placer mining, *Water pollution), (*Alaska, Water pollution), (*Mining, Water pollution).

The objectives of the study undertaken were to find answers to the following questions: What is the nature and extent of placer mining activities in Alaska. What effects do placer mining operations exert on water quality and water use. What treatment and control methods are presently being used, or could be used, for the control of placer mining wastes. The scope of the study was confined to the State of Alaska. The districts studied were: Fairbanks District; Tolovana District; Iditarod District; Seward Peninsula District; Koyukuk District; Wiseman District.

PB-215 564
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
KANSAS RIVER DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
Feb 53, 59p PHS-Pub-234, PHS-WPS-38
Prepared in cooperation with Kansas Board of Health, Nebraska Department of Health, and Colorado Department of Public Health.

Descriptors: (*Kansas River Basin, *Water pollution), (*Kansas, Water pollution), (*Nebraska, Water pollution), (*Colorado, Water pollution).

The report is produced under the cosponsorship of the Colorado Department of Public Health, the Kansas State Board of Health, the Nebraska Department of Health, and the Public Health Service. It is based on data gathered and reported in the Kansas River Basin Water Pollution Investigation Report of 1949 and subsequent information. The report presents data concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect, and those needed. A sincere effort has been made to present a picture of the water pollution problems in the Kansas River Basin.

PB-215 565
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
A COMPREHENSIVE PROGRAM FOR CONTROL OF WATER POLLUTION-MISSOURI DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
Jul 53, 131p PHS-Pub-317, PHS-WPS-56

Descriptors: (*Missouri River Basin, *Water pollution).

The report presents a comprehensive water pollution control program for the Missouri River Drainage Basin as developed by the State Water Pollution Control Agencies. Included is a project list by States indicating sewage and industrial waste treatment needs. Sub-Basin sections include a list of all sources of pollution by river location. (Author)

PB-215 566
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
GRAND-CHARITON DRAINAGE BASINS. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
Walter L. Bierring, and James R. Amos. Jun 52, 53p PHS-Pub-128, PHS-WPS-22
Prepared in cooperation with the Iowa Department of Health and the Missouri Division of Health.

Descriptors: (*Grand River Basin, *Water pollution), (*Chariton River Basin, *Water pollution), (*Iowa, Water pollution), (*Missouri, Water pollution).

The report is concerned with municipalities and industries in the preparation or adoption of comprehensive programs for eliminating or reducing the pollution of interstate waters and tributaries thereof, and improving the sanitary condition of surface and underground waters. Due regard is noted for improvements necessary to conserve the waters for public water supplies, propagation of fish and aquatic life, recreational purposes, agricultural and other legitimate uses of the Grand and Chariton River Basins located in Iowa and Missouri.

PB-215 567
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SUMMARY REPORT ON EFFLUENT DISPOSAL CONSIDERATIONS IN POSSIBLE PULP AND PAPER MILL DEVELOPMENTS IN SOUTHEASTERN MISSOURI.
1960, 22p
Prepared in cooperation with the Missouri State Water Pollution Board.

Descriptors: (*Paper industry, Water pollution), (*Missouri, *Water pollution), Industrial wastes.

The report summarizes information obtained in a preliminary effluent disposal study of certain river basin areas which have been suggested as possible locations for pulp and paper mills in the southeastern portion of the State of Missouri. The river basins involved in the study were Gasconade, Current, Black, St. Francis, Big, and Meramec Rivers and the portion of the Mississippi River from Sainte Genevieve to New Madrid, Missouri. (Author)

PB-215 568
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
CENTRAL MISSOURI RIVER WATER QUALITY INVESTIGATION - 1955.
Aug 56, 94p

Descriptors: (*Missouri River, *Water pollution), (*North Dakota, Water pollution), (*South Dakota, Water pollution), (*Iowa, Water pollution).
Identifiers: *Water quality data.

The report concerns 1955 operations of the Central Missouri River Water Quality Investigation initiated in 1952. Presented are the 1955 data on the chemical, biological, and physical conditions of the Central Missouri River.

PB-215 569
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
FERTILIZATION AND ALGAE IN LAKE SEBASTICOOK, MAINE.

Jan 66, 131p

Descriptors: (*Lake Sebasticook, *Water pollution), (*Maine, Water pollution), Algae, Nutrients, Sewage, Industrial wastes.
Identifiers: *Water quality data.

The report discusses the algal growths in Lake Sebasticook at Newport, Maine. The algal growths are caused principally by nutrients contained in domestic and industrial plant wastes that are discharged to the East Branch of the Sebasticook River at Dexter and Corinna, Maine. These nutrients produce as much as 9,700,000 pounds of algae as a standing crop within the lake during those days of the year that are optimum for algal development.

PB-215 570
Federal Water Pollution Control Administration, College, Alaska. Alaska Water Lab.
QUARTERLY RESEARCH REPORT - JANUARY 1-MARCH 31, 1970, ALASKA WATER LABORATORY, COLLEGE, ALASKA.

31 Mar 70, 24p

Descriptors: (*Alaska, Water pollution), (*Water pollution, Research), Sewage treatment.

The report describes research concerning Alaska's water quality and sewage treatment.

PB-215 571
Florida Univ., Gainesville.
TO DEMONSTRATE THE EFFECTIVENESS OF IODINE FOR THE DISINFECTION OF PUBLIC WATER SUPPLIES, AND TO DETERMINE THE PHYSIOLOGICAL EFFECTS ON A HUMAN POPULATION.
Progress rept. no. 4, 1 Nov 65-30 Jun 66,
A. P. Black. 5 Jul 66, 66p
Grant WPD-19-01-66

Descriptors: (*Water treatment, Disinfection), (*Iodination, *Disinfection), Public health.

The water supplies of three state institutions serving approximately 800 individuals in Florida have been continuously iodinated for a period of more than two years under the most careful chemical, bacteriological and physiological controls. One of each of four inmates was selected for medical and physiological tests, a total of 149 subjects. The studies indicate that iodine is fully as effective as chlorine for the disinfection of public water supplies and that it possesses a number of advantages over chlorine when used for that purpose.

PB-215 572
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
JAMES RIVER DRAINAGE BASIN. A COOPERATIVE STATE-DFEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
Apr 52, 142p PHS-Pub-187, PHS-WPS-35
Prepared in cooperation with the North Dakota Department of Health, the South Dakota Department of Health, and the Bureau of Reclamation.

Descriptors: (*James River Basin, *Water pollution), (*North Dakota, Water pollution), (*South Dakota, Water pollution), Missouri River Basin.

The scope of the report includes: The extent, types, and major sources of pollution; A review of existing laws and pending legislation regarding pollution of public waters in the States of North Dakota and South Dakota; Minimum stream flows necessary for public water supplies; Quality of water; Public health benefits of water pollution abatement resulting from the conservation, regulation, and use of water supplies under the Missouri River Basin program; Recommendations for pollution abatement; Effect of current and possible future pollution on water to be used for irrigation; and Other public health considerations.

PB-215 573
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
CENTRAL MISSOURI RIVER WATER QUALITY INVESTIGATION, AUGUST 1952--DECEMBER 1953.
Apr 54, 113p

Descriptors: (*Missouri River Basin, *Water pollution), (*North Dakota, Water pollution), (*South Dakota, Water pollution), (*Nebraska, Water pollution), (*Iowa, Water pollution).
Identifiers: *Water quality data.

The first 17 months (August, 1952 - December, 1953) of the study are reported herein. Data presented and discussed cover certain physical, chemical, and biological aspects of the Missouri River (Williston, North Dakota, to Omaha, Nebraska) and their interrelationships for 11 months before and 6 months after significant impoundment in Fort Randall Reservoir.

PB-215 574
National Center for Urban and Industrial Health, Cincinnati, Ohio.
CONSTRUCTION AND UTILIZATION OF A SIMPLE DEVICE FOR THE PRODUCTION OF REACTIVATABLE PHOSPHATASE.
Environmental health series,
C. B. Donnelly, J. E. Leslie, J. D. McDaniel, and L. A. Black. 1967, 22p PHS-Pub-999-UIH-5

Descriptors: (*Milk, *Pasteurizing), (*Phosphatases, Milk).

A laboratory-scale device for the heat-treatment of cream, with a capacity of 5 liters per hour, is described. The apparatus consists of a heating coil of small-diameter nylon tubing immersed in a constant-boiling liquid bath, through which milk or cream can be forced at a constant flow rate by air pressure. Cost of materials and labor is estimated at $80.00. Cream heat-treated in the device contained reactivatable phosphatase that was suitable for testing an analyst's ability to detect reactivated phosphatase. Such heat-treated products have been used successfully in a national split-sample program. (Author)

PB-215 575
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WASTES FROM THE POULTRY PROCESSING INDUSTRY.
Technical rept.,
Ralph Porges, and Edmund J. Struzeski, Jr. 1962, 49p SEC-TR-W62-3

Descriptors: (*Industrial waste treatment, *Food industry).
Identifiers: *Poultry processing, *Water pollution control.

The slaughtering and dressing of poultry is one of the smaller industries but nevertheless a very important one. Modern development has been towards centralization of poultry plants. In certain areas of the country where poultry processing establishments have concentrated, the problem of waste disposal is critical. Even one plant of average size or greater may pose a serious waste problem in a small town. The study was undertaken because of the interest shown by regulatory agencies, industry, consulting engineers, and others concerned with water use and waste disposal. The primary intent of this report is to show suitable means of waste water utilization, reduction, and disposal. Although much of the information has been obtained from the published record, considerable data have been derived from field investigation and contacts with many people vitally interested in the poultry industry.

PB-215 576
Federal Water Pollution Control Administration, Cincinnati, Ohio. Ohio Basin Region.
FWPCA PRESENTATIONS ORSANCO ENGINEERING COMMITTEE, MAY 13-14, 1969, MEETING (69TH) NETHERLAND HILTON HOTEL, CINCINNATI, OHIO,
Richard A. Vanderhoof, Kenneth M. Mackenthun, Keith O. Schwab, Bern Wright, and Kenneth E. F. Hokanson. 1969, 78p

Descriptors: (*Ohio River, *Water pollution).

Contents:
FWPCA recommendations;
Acceptable water quality in mixing areas;
Present temperature conditions of the Ohio River;
Individual states adopted temperature criteria;
Aquatic life temperature requirements;
Present dissolved oxygen conditions of the Ohio River;
Individual states adopted dissolved oxygen criteria;
Productivity and seasonal variations related to aquatic life dissolved oxygen requirements;
Present pH conditions of the Ohio River;
Individual states adopted pH criteria;
Aquatic life pH requirements;
Implementation plan compliance for the Ohio River;
Present bacteriological conditions of the Ohio River;
Individual states adopted bacterial criteria.

PB-215 577
Federal Water Pollution Control Administration, Needham Heights, Mass. New England Basins Office.
NEW HAVEN HARBOR. SHELLFISH RESOURCE AND WATER QUALITY.
Aug 70, 108p CWT-10-25

Descriptors: (*New Haven Harbor, *Water pollution), (*Massachusetts, Water pollution), (*Shellfish, New Haven Harbor).

The report presents an evaluation of water quality in New Haven Harbor in 1967, an enumeration of waste discharges related to the problem and a detailed description of the shellfish resource in this area, including the subsequent effects of water quality to this resource. (Author)

PB-215 578
Cornell Univ., Ithaca, N.Y. Dept. of Sanitary Engineering.
MASS TRANSFER INTO NON-NEWTONIAN SYSTEMS.
Annual progress rept. 1 Sep 62-31 Aug 63,
V. C. Behn. 31 Oct 63, 7p
Grant FWPCA-WP-229-03
See also report dated 28 Feb 66, PB-215 579.

Descriptors: (*Diffusion, *Fluid flow), (*Benzoic acid, *Mass transfer).

The report discusses the year's work on the mass transfer of a solid into a flowing liquid.

PB-215 579
Cornell Univ., Ithaca, N.Y. Dept. of Sanitary Engineering.
MASS TRANSFER INTO NON-NEWTONIAN SYSTEMS.
Final progress rept. 1 Sep 63-31 Aug 65,
V. C. Behn. 28 Feb 66, 20p
Grant FWPCA-WP-229-04
See also report dated 31 Oct 63, PB-215 578.

Descriptors: (*Benzoic acids, *Mass transfer), (*Diffusion, *Fluid flow).

The work described is concerned with a study of diffusion of benzoic acid at constant temperature into kaolinite slurries of varying concentration.

PB-215 580
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY CONTROL STUDY, MEDICINE LODGE RIVER BASIN, KANSAS, OKLAHOMA: STUDY OF NEEDS AND VALUE OF STORAGE FOR WATER QUALITY CONTROL.
Jul 65, 32p

Descriptors: (*Medicine Lodge River Basin, *Reservoirs), (*Kansas, *Water resources), (*Oklahoma, *Water resources).

The purpose of the study is to estimate water requirements for water quality control purposes to the year 2020 in the Medicine Lodge River basin which is encompassed in the six-county study area; Kiowa, Pratt, Comanche, and Barber Counties in Kansas, and Woods and Alfalfa Counties in Oklahoma. Estimates are made of the value of benefits attributable to storage and release of water for this purpose in Kiowa and Amber Reservoirs, proposed Federal projects. (Author)

PB-215 581
Aeroject-General Corp., El Monte, Calif. Environmental Systems Div.
DEMONSTRATION OF INDUSTRIAL WATER RENOVATION PLANT AT ODESSA, TEXAS.
Progress rept. no. 4.
Jan 68, 106p
Grant WPRD-31-01-67

Descriptors: (*Water reclamation, *Osmosis), (*Industrial water, Water reclamation), (*Water treatment, Osmosis), Membranes.
Identifiers: *Reverse osmosis.

The report presents the operation of an industrial water renovation unit at Odessa, Texas. Bench-scale reverse-osmosis (R-O) tests were conducted to determine the effects of isopropyl alcohol and pH on membranes, to test membrane performance on pretreated water, and to determine whether periodic membrane flushing improves performance.

PB-215 582
Public Health Service, Denver, Colo. Region VIII.
STUDY OF POTENTIAL NEEDS AND VALUE OF WATER FOR THE PURPOSE OF WATER QUALITY CONTROL OF THE LOWER MUSSELSHELL PROJECT, MONTANA.

Feb 66, 38p
Prepared in cooperation with the Bureau of Reclamation, Billings, Mont. Region 6.

Descriptors: (*Montana, *Water resources), (*Musselshell River Basin, *Reservoirs), Water quality.
Identifiers: *Garfield County (Montana), *Petroleum County (Montana).

The general objectives of the study are to assess the effects of a reservoir project construction and operation on the water quality in streams and reservoirs in Garfield and Petroleum Counties in east-central Montana; to ascertain what benefits are achieved or lost from changes in water quality; to assess the suitability of the water for its proposed uses; and to examine the need for streamflow regulation for the purpose of water quality control. The necessity of streamflow regulation was studied not only in light of present conditions but also for anticipated future conditions in the study area to the year 2065. (Author)

PB-215 583
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, LITTLE BLUE RIVER BASIN, MISSOURI.

Mar 66, 39p

Descriptors: (*Little Blue River Basin, Water resources), (*Missouri, *Water resources).

Identifiers: *Jackson County (Missouri), *Cass County (Missouri).

The purpose of the study was to determine the need for and value of storage for municipal and industrial water supply and water quality control in the Little Blue River Basin. The Little Blue River Basin drains an area of 225 square miles in Jackson and Cass Counties located in west-central Missouri. The study covers a 100-year period, 1970 to 2070, as requested by the Corps of Engineers. (Author)

PB-215 584
Public Health Service, Chicago, Ill. Upper Mississippi and Great Lakes Drainage Basins Office.
UPPER MISSISSIPPI DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.

1951, 99P PHS-WPS-15 PHS-Pub-150
Prepared in cooperation with Illinois Sanitary Water Board, Indiana Stream Pollution Control Board, Iowa State Dept. of Health, Minnesota Dept. of Health, Missouri Dept. of Public Health and Welfare, North Dakota State Dept. of Health, South Dakota Committee on Water Pollution, and Wisconsin Committee on Water Pollution.

Descriptors: (*United States, *Water Resources), (*Mississippi River Basin, *Water pollution).

The report present information about the ways water resources are used, the pollution going into our water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required. There are two parts. Part one considers the water pollution problems of the basin as a whole. Part two presents briefly the data for each of the several sub-basins of the major basin, including a tabulation of pollution abatement projects now known to be needed for water pollution control. (Author)

PB-215 585
Florida Atlantic Ocean Sciences Inst., Boca Raton.
DEMONSTRATION OF THE LIMITATIONS AND EFFECTS OF WASTE DISPOSAL ON AN OCEAN SHELF.
Annual project rept. 1 Apr 67-1 Apr 68,
Raymond F. McAllister. Mar 68, 105p
Grant WPD-165-01-67

Descriptors: (*Oceans, *Water pollution), (*Outfall sewers, Water pollution), Coasts, Chemical composition.
Identifiers: *Water pollution effects (Plants), *Sewage treatment effluents.

The report describes an indepth analysis of the marine environment in the vicinity of coastal sewer outfalls. Studied are ocean currents, the microbiota, the water salinity, and other pertinent factors that are indicators of pollution.

PB-215 586
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
STUDY OF OMAHA, NEBRASKA, MEAT--PACKING WASTES.

Feb 65, 55p

Descriptors: (*Food processing, Water pollution), (*Missouri River, Water pollution).
Identifiers: *Meat packing industry, *Omaha (Nebraska), *Water quality data.

The report describes and presents the findings of a survey of meat-packing house wastes discharged to the Missouri River at Omaha, Nebraska, during the period November 30 to and including December 12, 1964. The objective of the study was to secure data on the volume and characteristics of the wastes to the Monroe Street and South Omaha sewerage system. An evaluation of the pollution, particularly in terms of coliform bacteria, grease, solids, and oxygen demand, is included because of the decision to continue discharge of paunch manure and accompanying wastes to the city sewers. Grease quantities were measured because of experience of detrimental effects upon downstream water uses, including the St. Joseph, Missouri, municipal water treatment plant. The operation of the Omaha-Missouri River sewage treatment plant was reviewed.

PB-215 587
Federal Water Pollution Control Administration, Cincinnati, Ohio.
PRELIMINARY DESIGN AND SIMULATION OF CONVENTIONAL WASTEWATER RENOVATION SYSTEMS USING THE DIGITAL COMPUTER.
Water pollution control research series,
Robert Smith. Mar 68, 126p WP-20-9

Descriptors: (*Sewage treatment, Performance evaluation), (*Cost estimates, Sewage treatment), Computer programs.

The report is an effort to combine in a single computational model the significant cost and performance relationships of the physical, chemical, and biological processes governing operation of wastewater treatment facilities.

PB-215 588
Department of Health, Education and Welfare, Washington, D.C.
SUMMARY OF CONFERENCE AND CONCLUSIONS AND RECOMMENDATIONS ON INTERSTATE AIR POLLUTION, NATIONAL CAPITAL METROPOLITAN AREA.
Dec 67, 33p

Descriptors: (*Air pollution, *District of Columbia), (*Air pollution, *Virginia), (*Air pollution, *Maryland).
Identifiers: *Washington Metropolitan Area.

Meteorological evidence demonstrated that pollutants discharged into the atmosphere in the District of Columbia, Virginia and Maryland are transported across their respective borders into neighboring jurisdictions subject only to the vagaries of wind and weather. It was further shown that in the National Capital metropolitan area topography allows free air movement across political boundaries because of the absence of significant natural or artificial obstructions. That such discharges cause or contribute to interstate air pollution which endangers health or welfare was demonstrated by a number of experts in many fields. Recommendations for abatement are summarized.

PB-215 589
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE DENVER AREA AIR POLLUTION PROBLEM,
Jean J. Schueneman. Jun 57, 84p
Prepared in cooperation with City and County of Denver Dept. of Health and Hospitals and Building Dept.; the Tri-County Health Dept.; Colorado State Dept. of Public Health; and the Public Health Service Regional Office, Denver, Colo.

Descriptors: (*Air pollution, *Colorado), Government policies.
Identifiers: *Denver (Colorado).

The purposes of this study were developed at a conference between representatives of Denver area government agencies and the Public Health Service. The purposes of this report are to: Review the existing and potential air pollution situation in Denver; Review existing air pollution control activities; and Develop recommendations for legislation, organization, staff, facilities and program relative to air pollution control activities.

PB-215 590
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
POLLUTIONAL EFFECTS OF PULP AND PAPER MILL WASTES IN PUGET SOUND.

Mar 67, 487p
Prepared in cooperation with Washington State Pollution Control Commission, Olympia.

Descriptors: (*Paper industry, Water pollution), (*Washington (State), Water pollution), (*Puget Sound, *Water pollution), Industrial wastes.

The report presents the work and findings of the Washington State Enforcement Project, a joint Federal-State program investigating water pollution in Puget Sound. The Project conducted investigations in four parts of the Sound and is primarily concerned with the pollutional effects of wastes discharged by seven pulp and paper mills. These study areas and mills are: Bellingham - Georgia-Pacific Corporation (formerly Puget Sound Pulp and Timber Company); Anacortes - Scott Paper Company; Everett - Scott Paper Company; Weyerhaeuser Company (sulfite pulp mill); Simpson Lee Paper Company; and Port Angeles - Fibreboard Paper Products Corporation; Rayonier Incorporated.

PB-215 591
Public Health Service, Denver, Colo. Region VIII.
BARR LAKE AND ITS ODOR RELATIONSHIPS,
Robert O. Sylvester. Dec 65, 53p PR-5
Report on South Platte River Basin Project.

Descriptors: (*Barr Lake, Water pollution), (*Platte River, *Water pollution), (*Colorado, Water pollution), Odors.
Identifiers: *Denver (Colorado), *Adams County (Colorado).

The report describes an investigation of odors emanating from Barr Lake in Adams County adjacent to Denver, Colorado. It is used for irrigation purposes and attributed to improper treatment of sewage. Corrective measures for water quality improvement are suggested.

PB-215 592
Robert A. Taft Sanitory Engineering Center, Cincinnati, Ohio.
TEMPERATURES REQUIRED FOR SAFELY STORING PERISHABLE FOODS,
Robert Angelotti, Milton J. Foter, and Keith H. Lewis. 1959, 8p
Presented at the Laboratory Section, American Public Health Association, Atlantic City, N. J., 21 Oct 59.

Descriptors: (*Food storage, *Food sanitation), Salmonella, Staphylococcus.

The report presents graphs showing the growth and behavior of salmonellae and staphylococci in chicken a la king, in custard, and in ham salad incubated at various temperatures.

PB-215 593
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
CONTROLLED ENVIRONMENT FACILITIES: A SURVEY.
Technical rept.,
John M. Henderson. 1961, 60p SEC-TR-W61-6

Descriptors: (*Environment simulators, *Laboratories).

With the increasing attention to environmental aspects of water quality, interest has developed in the feasibility of using controlled environment facilities in this research. Such facilities may make possible acceleration of important developments, whether the research relates to special variables under controlled conditions, or whether the need is to simulate a natural complex consistently over a period of time. Design requirements of controlled facilities must be approached thoughfully to achieve the desired results. Accordingly the Division of Water Supply and Pollution Control, Research Branch, enlisted the services of the author to survey some of the facilities of this type available in the United States. The present report summarizes his notes and observations.

PB-215 594
Federal Water Pollution Control Administration, Washington, D.C.
WATER POLLUTION CONTROL ACT. PUBLIC LAW 660: AS AMENDED BY THE FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1961 - (PL 87-88), AND BY THE WATER QUALITY ACT OF 1965 - (PL 89-234).
1965, 20p

Descriptors: (*Water pollution, *Public law), Regulations.

Presented is the Water Pollution Control Act as amended which governs Federal and State roles in enacting and monitoring activities relative to water pollution control.

PB-215 595
National Center for Air Pollution Control, Cincinnati, Ohio.
WASHINGTON, D.C., METROPOLITAN AREA AIR POLLUTION ABATEMENT ACTIVITY.
Nov 67, 215p

Descriptors: (*District of Columbia, *Air pollution), (*Maryland, *Air pollution), (*Virginia, *Air pollution).
Identifiers: *Washington Metropolitan Area, *Air quality data.

The report is based upon an investigation of air pollution conducted in the Washington, D.C., metropolitan area in the period of February, 1967 to August, 1967.

PB-215 596
Federal Water Pollution Control Administration, Metuchen, N. J. Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project.
IMMEDIATE WATER POLLUTION CONTROL NEEDS FOR THE INTERSTATE AND INTRASTATE WATERS OF THE HUDSON-MOHAWK REGION.

Jun 67, 120p

Descriptors: (*Water pollution, *Hudson River Basin), (*Water pollution, *Mohawk River Basin), (*New York, Water pollution).

The report reviews the water pollution problem in the Hudson-Mohawk Region, which is defined to include the waters in the Mohawk River Basin east of, and including Rome, New York and the Hudson River Basin north of the Bear Mountain Bridge at the Orange and Putnam Counties' southern boundaries. The discharge of wastes from municipalities, industries and other sources degrades water quality, preventing full utilization of these waters. The purpose of the report was to delineate those actions which should be undertaken immediately to prevent further degradation and to provide enhancement of these waters. (Author)

PB-215 597
Federal Water Pollution Administration, Kansas City, Mo. Missouri Basin Region.
COMPENDIUM OF ANIMAL WASTE MANAGEMENT (2ND),
Anthony V. Resnik, and John M. Rademacher. Jun 69, 258p

Descriptors: (*Water quality, *Agricultural wastes), Livestock, Water pollution, Drainage, Surface waters.
Identifiers: *Water pollution control, *Feedlot wastes.

The purpose of this paper is to discuss the causes and effects of animal waste pollution on water quality. Present accomplishments relative to pollution control by regulation are set forth.

PB-215 598
Federal Water Pollution Control Administration, Denver, Colo. Region VIII.
WATER QUALITY CONTROL STUDY. POWDER RIVER BASIN, KAYCEE UNIT, WYOMING.

Feb 66, 32p

Descriptors: (*Powder River Basin, Water pollution), (*Wyoming, Water pollution).

A survey has been made of the Powder River Basin and the Kaycee Unit in particular which determined that waters of the area are at times highly mineralized. Because of the lack of beneficial water users below the project, storage for streamflow regulation for the purpose of water quality control has not been recommended. (Author)

PB-215 599
Ludwig Engineering and Science Research Foundation, Arcadia, Calif.
FLOC STRENGTH AND FILTERABILITY OF PRETREATED WATER.
Annual rept. 1966-1967.
Nov 67, 66p
Grant FWPCA-WP-00813-01

Descriptors: (*Water treatment, *Filtration), Filterability.

The significance of floc strength in the filtration process was reviewed, and two methods for its measurement were developed. Of the two, the measurement of the median size of the floc following fragmentation under high shear stress was considered to represent floc strength reasonably well. pH and coagulant dosage were found to affect the strength of floc as measured by this method. (Author)

PB-215 600
Kansas Univ., Lawrence.
INTERNATIONAL SYMPOSIUM FOR WASTE TREATMENT LAGOONS (2ND) HELD IN KANSAS CITY, MO., 23-25 JUN 70,
Ross E. McKinney. 1970, 405p

Descriptors: (*Lagoons (Ponds), *Meetings), (*Sewage treatment, Lagoons (Ponds)), (*Industrial waste treatment, Lagoons (Ponds)).
Identifiers: *Aeration ponds, *Anaerobic ponds.

The report presents the papers given at the symposium. They deal with such diverse subjects as public health, standards, design, microbiology, disinfection, and industrial waste treatment.

PB-215 601
Pacific Northwest Water Lab., Corvallis, Oreg.
PILOT PLANT STUDIES ON SECONDARY TREATMENT OF POTATO PROCESSING WASTES.
Progress rept.,
Robert W. Vivian, and Kenneth A. Dostal. Jan 68, 85p PR-4

Descriptors: (*Food processing, *Industrial waste treatment), Anaerobic processes, Aerobic processes.
Identifiers: *Potato processing, Biological industrial waste treatment, *Water pollution control.

Potato wastes are one of the major pollutional sources in the State of Idaho. Even with primary treatment afforded by all processing plants, these wastes, in combination with other wastes, have resulted in fish kills and other pollution problems during periods of low flow in receiving streams. The potato processors are now faced with providing secondary treatment for their wastes and recognize that the cost of waste treatment must be considered to be part of the cost of doing business. The objective of the study is to conclude pilot plant studies on feasible methods of secondary treatment of potato processing wastes. Two specific methods are being investigated: an anaerobic lagoon followed by a surface-aerated, aerobic lagoon and an aerobic lagoon system. Due to late arrival of a surface-aerator the progress report covers only the first system - an anaerobic lagoon followed by a surface-aerated, aerobic lagoon.

PB-215 603
Oregon State Univ., Corvallis. Engineering Experiment Station.
WASTE WATER LAGOON CRITERIA FOR MARITIME CLIMATES.
Progress rept. 1 Dec 59-1 Jun 61,
Frederick J. Burgess, and Martin E. Northcraft. 1 Jun 61, 71p
Grant PHS-RG-6784

Descriptors: (*Sewage treatment, *Lagoons (Ponds)).
Identifiers: *Aeration ponds.

Waste water oxidation lagoon studies were conducted at Oregon State University to establish criteria for their use in the maritime climates of the Pacific Northwest. An experimental facility was constructed consisting of two cells, each one acre in surface area and three feet deep on which studies were conducted. Emphasis was placed on determination of basic factors influencing lagoon use under various conditions. These include surface reaeration mechanics, sludge accumulation and respiration, bacteriological quality, and disinfection requirements, together with other problems as defined in this report. (Author)

PB-215 604
California Univ., Berkeley. Sanitary Engineering Research Lab.
PROCEEDINGS OF THE EUTROPHICATION--BIOSTIMULATION ASSESSMENT WORKSHOP HELD AT HOTEL CLAREMONT, BERKELEY, CALIFORNIA 19-21 JUNE 1969,
E. J. Middlebrooks, T. E. Maloney, C. F. Powers, and L. M. Kaack. Jun 69, 285p
Sponsored by Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.

Descriptors: (*Bioassay, Water pollution), (*Algae, *Water pollution), (*Limnology, Algae), Plant growth, Nutrients.
Identifiers: *Water pollution effects (Plants), *Eutrophication, Nutrient requirements.

The report presents the results of a workshop on eutrophication-biostimulation including: Assay procedures session; Algal physiology session; Limnological investigations session; Eutrophication control and applications session.

PB-215 644
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

ANNUAL REVIEW OF LITERATURE ON RADIOACTIVITY STUDIES OF AIR, WATER, AND WASTES (1954),
Lloyd R. Setter. Feb 55, 43p

Descriptors: (*Radioactive contaminants, *Reviews), (*Air pollution, Radioactive contaminants), (*Water pollution, Radioactive contaminants), Fallout.

Contents: Radioactivity- General; Natural background; Fall-out; Contamination and decontamination; Surveys and water treatment; Sewage and industrial waste treatment and disposal; Utilization; Biological effects; Radiochemical methods; Instrumentation; References; Addendum on tritium, carbon 14, and Miscellaneous radioactivity literature - Tritium; Carbon-14; Spectroscopy and special counters; Addendum references.

PB-215 645
Public Health Service, Kansas City, Mo. Region VI.
WATER RESOURCES STUDY, PLATTE RIVER BASIN, IOWA AND MISSOURI. (STUDY OF POTENTIAL NEEDS AND VALUE OF WATER STORAGE FOR MUNICIPAL, INDUSTRIAL, AND QUALITY CONTROL PURPOSES.)
Mar 64, 51p

Descriptors: (*Platte River Basin, *Reservoirs), (*Missouri, *Water resources), (*Iowa, *Water resources), Trends, Water consumption.

The purpose of this study is to determine the need for and value of storage for municipal and industrial water supply and quality control in the Platte River Basin which is 2,440 square miles and is located in northwest Missouri and southwest Iowa. The study covers water storage needs and values during the 100-year study period, 1970 to 2070, as requested by the Corps of Engineers. (Author)

PB-215 646
Federal Water Pollution Control Administration, Metuchen, N.J. Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project.
REPORT ON IMMEDIATE WATER POLLUTION CONTROL NEEDS, INTERSTATE AND INTRASTATE WATERS, LONG ISLAND REGION.
Apr 67, 99p

Descriptors: (*Long Island, *Water pollution), (*New York, Water pollution).
Identifiers: *Nassau County (New York), *Suffolk County (New York).

The report reviews the water pollution problems in the Long Island Region, which consists of Nassau and Suffolk Counties in New York State. The discharge of waste from municipalities and numerous other sources degrades water quality and prevents full utilization of this natural resource throughout the Region. The purpose of the report is to delineate those actions which should be undertaken immediately to prevent further degradation of these waters. Such actions include not only construction of new or improved municipal and industrial waste treatment facilities, but also those studies, surveys and research which must be completed prior to development of sound water quality management programs for the future.

PB-215 647
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
AN ANALYSIS OF MUNICIPAL AND INDUSTRIAL WATER SUPPLY IN THE WILLAMETTE BASIN, OREGON,
J. E. Britton. Apr 65, 83p Working Paper-55
Report on Columbia River Basin Comprehensive Project for Water Supply and Pollution Control.

Descriptors: (*Willamette River Basin, *Water resources), (*Oregon, *Water resources), Trends, Water supply, Water consumption.

The report was prepared with several thoughts in mind other than merely to present a numerical description of the present and projected municipal water supply situation in the Willamette River Basin, Oregon. Factors that influence development and utilization of the water resource were examined in an effort to identify the major influences with this basin. Many of the factors have been subjects of individual studies at various times and places with little success in arriving at a universal formula for applying the influencing factors. Consideration of resource development resulted in several conclusions applicable to this basin at the present time.

PB-215 648
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT OF A SURVEY OF THE FISH POISONING PROBLEM IN THE MARSHALL ISLANDS,
A. F. Bartsch, R. H. Drachman, and E. F. McFarren. Jan 59, 126p

Descriptors: (*Marine fishes, *Food poisoning), (*Marshall Islands, Food poisoning).

The report covers of a survey of human poisoning in the Marshall Islands resulting from consumption of toxic fishes. The report gives conclusions on the present magnitude and recent growth of the problem, lack of relationship to radioactivity, availability of toxic fishes, the clinical character of the affliction and present therapy, and the need for further study.

PB-215 649
Public Health Service, Cincinnati, Ohio. Div. of Air Pollution.
AIR QUALITY DATA FROM THE NATIONAL AIR SAMPLING NETWORKS AND CONTRIBUTING STATE AND LOCAL NETWORKS 1964-1965.
1966, 127p

Descriptors: (*United States, *Air pollution).
Identifiers: *Air quality data, *National Air Surveillance Networks.

This report summarizes air quality data gathered during 1964 and 1965 at nearly 300 stations that gathered bi-weekly samples of suspended particulate matter, about 30 stations that gathered bi-weekly samples of two gaseous pollutants, and another seven stations that continuously monitored six gaseous pollutants, suspended particulates, and soiling index. This volume also continues the policy of including summaries of data contributed by state and local agencies that operate their own air sampling networks. In addition to the basic data on suspended particulates and gases, data on several fractions of the particulate matter are included herein. These are generally presented for years earlier that 1964-1965, not only because the chemical analysis of the particulate samples behind the primary weight determination, but also because expanded laboratory capacity has permitted the analysis of earlier samples held in reserve.

PB-215 650
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
AERATED LAGOON TREATMENT OF FOOD PROCESSING WASTES.
Progress rept.,
Kenneth A. Dostal. Mar 68, 52p PR-5

Descriptors: (*Food processing, *Industrial waste treatment), (*Lagoons (Ponds), Industrial waste treatment).
Identifiers: *Aeration ponds, *Water pollution control.

The purpose of this study was to gather good operational data on a full-scale aerated lagoon which is used to treat food-processing wastes. This report presents the data collected and the conclusions drawn from a six-week period of sampling of an aerated lagoon used to treat wastes from the frozen pea processing plant of Kelley-Farquhar located at Ferndale, Washington.

PB-215 651
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
A REPORT OF WATER POLLUTION IN THE YELLOWSTONE DRAINAGE BASIN.
Water Pollution Series.

Jan 52, 69p PHS-Pub-129, PHS-WPS-23

Descriptors: (*Yellowstone River Basin, *Water pollution), (*Montana, Water pollution), (*Wyoming, Water pollution).

The report is produced under the cosponsorship of the Montana State Board of Health, North Dakota State Department of Health, Wyoming Department of Public Health, and the Public Health Service. It is based on data available as of January 1, 1952, on sources of pollution, treatment facilities employed, and stream conditions. The report also presents information concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect and those which appear to be needed. A sincere effort has been made to present a fair picture of the water pollution problems in the Yellowstone Basin and to present reasonable conclusions and recommendations.

PB-215 652
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AN APPROACH TO THE IDENTIFICATION OF PETROLEUM REFINERY WASTES IN SURFACE WATERS,
A. A. Rosen, and F. M. Middleton. 1954, 15p
Presented before the Division of Water, Sewage, and Sanitation Chemistry at the 125th Meeting of the American Chemical Society, Kansas City, Missouri, March 23 to April 1, 1954.

Descriptors: (*Refineries, Industrial wastes), (*Industrial wastes, Water analysis), (*Hydrocarbons, *Water analysis), Infrared spectra, Spectroscopic analysis.
Identifiers: *Water pollution detection.

Because of their large volumes and high odor intensities the most significant pollution effect of petroleum refinery process water effluents is the production of tastes and odors in receiving waters. The major organic component of petroleum refinery wastes is the neutral group, consisting of hydrocarbons and closely related compounds which do not form salts with acids or bases. A large proportion of the odorous organic components is contained in the neutral group. The report describes the analysis of the compounds of this group. In this method, organic substances are recovered from the water by adsorption on activated carbon and subsequent elution, then are compared with a sample of refinery waste materials on the basis of elemental analysis, physical and chemical properties, and infrared spectra. To minimize the interference of oxygenated compounds, the method described in this paper utilizes adsorption chromatography on silica gel to remove oxygenated substances.

PB-215 653
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
LOWER WILLAMETTE BASIN (OREGON). PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.

Sep 62, 23p Working Paper-30

Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River Basin, *Economic development), (*Oregon, Economic development), River basin development.

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the subject area. The study period is the 50-year period 1960-2010, with an interim point at 1985.

PB-215 654
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY CONTROL STUDY, BUMPING LAKE.
Jan 66, 102p
Report on Yakima River Basin, Enlargement Project.

Descriptors: (*Yakima River Basin, *Water pollution), (*Washington (State), Water pollution), Reservoirs, Water resources.
Identifiers: Benton County (Washington), Killitas County (Washington), Yakima County (Washington).

The investigation on which this report is based was conducted for the purpose of advising the Bureau of Reclamation on the need for and value of storage in Bumping Lake Enlargement, Yakima River Basin, for water quality control. To accomplish this, all available data on water uses, waste sources, and water quality were examined, evaluated, and projected. Field data collected by the Public Health Service and Washington State Pollution Control Commission in 1961 and 1962 aided the evaluations. The area covered in the report included all of the Yakima River Basin drainage and is defined demographically by areas within Benton, Kittitas, and Yakima Counties.

PB-215 655
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
PROCEEDINGS PUBLIC MEETING ON WATER QUALITY MANAGEMENT FOR ESTUARIES, HELD 28-29 JANUARY 1969, AT PAGODA HOTEL, HONOLULU, HAWAII.

29 Jan 69, 186p
Report on Clean Water for the Nations Estuaries.

Descriptors: (*Estuaries, *Water pollution), (*Hawaii, Water pollution).

The transcript is an important part of the national estuarine pollution study. It includes recommendations for a comprehensive national program for the preservation, use and development of the estuaries; and the respective responsibilities which should be assumed by federal, state and local governments, and by public and private interests.

PB-215 656
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
PROCEEDINGS OF PUBLIC MEETING ON WATER QUALITY MANAGEMENT FOR ESTUARIES, LOS ANGELES, CALIFORNIA, 25-26 FEBRUARY 1969, HELD AT JUNIPERO SERRA BUILDING, LOS ANGELES, CALIFORNIA.
26 Feb 69, 234p
Report on Clean Water for the Nation's Estuaries.

Descriptors: (*Estuaries, *Water pollution), (*California, Water pollution).

The report includes recommendations for a comprehensive national program for the preservation, use and development of the estuaries; and the respective responsibilities which should be assumed by Federal, State and local governments, and by public and private interests. Jointly sponsored by the State of California and the Pacific Southwest Region, Federal Water Pollution Control Administration the meeting provided an opportunity for all interested individuals and organizations to express their views on water quality management for the estuaries of the State of California.

PB-215 657
Public Helath Service, Portland, Oreg. Economic Studies Group.
TUALATIN RIVER AREA (OREGON) PRELIMINARY ESTIMATE OF ECONOMIC GROWTH, 1960-2010.
Oct 61, 11p Working Paper-5

Descriptors: (*Economic development, *Tualatin River Basin), (*Oregon, Economic development), Growth, Demography, Industrial relations, Statistical distributions, Reviews, Economic forecasting.
Identifiers: *Washington County (Oregon).

The analysis is intended to provide a preliminary estimate of the economic potentials and a broad guide to the anticipated growth of the Tualatin River drainage basin which conforms approximately to the boundaries of Washington County, Oregon.

PB-215 658
Federal Water Pollution Control Administration, Washington, D.C.
BULLETIN OF COURSES: WATER POLLUTION CONTROL TRAINING PROGRAM; JULY 1969 TO DECEMBER 1970.

28 Feb 69, 49p

Descriptors: (*Water pollution, *Education).
Identifiers: *Water pollution control.

The objective of the Training Program is to provide specialized training in the causes, prevention, and control of water pollution. Training not generally available elsewhere is featured in specialized subjects, including recent developments in sanitary engineering, chemistry, aquatic biology, and microbiology in the field and in the laboratory. It is expected that this training will lead to rapid application of new research findings, increase skills of technical and professional personnel, and train new employees recruited from other professional or technical areas in the special skills required in water pollution control. Scientists, engineers, and recognized authorities from other FWPCA programs other government agencies, universities, and industry, supplement the training staff by serving as guest lecturers and special consultants. (Author)

PB-215 659
Stanford Research Inst., Irvine, Calif.
INVESTIGATION OF PHOTOCHEMICAL REACTIVITIES OF ORGANIC SOLVENTS.
Final rept.,
K. W. Wilson, and G. J. Doyle. Sep 70, 87p
Contract CPA-22-69-125

Descriptors: (*Photochemistry, *Organic solvents), (*Smog, Organic solvents), (*Air pollution, Organic solvents), Nitrogen dioxide.

The photochemical reactivities of 20 commercial solvents were measured by experiments using a smog chamber. Each solvent was studied in a simple system comprising pure air, nitrogen dioxide, and the individual test solvent and in a more complex mixture comprising pure air, propylene, toluene, butane, and nitrogen dioxide and the test solvent. To the extent possible, the test solvents were selected to give groups of chemicals that differed systematically in certain structural features so that conclusions could be drawn relating structure and reactivity. Reactivities were evaluated by measuring dosages of nitrogen dioxide, oxidant, ozone, and PAN (peroxyacetyl nitrate); rates of disappearance of nitrogen dioxide, test solvent, propylene, toluene, and butane; eye irritation level; and maximum aerosol level. Some of these measurements varied sufficiently so that they could be used as criteria for ranking the solvents.

PB-215 660
Environmental Health Center, Cincinnati, Ohio.
INTERNATIONAL PAPER COMPANY, SOUTHERN KRAFT DIVISION PULP AND PAPER MILL, PANAMA CITY, FLORIDA, 17 MARCH TO 10 APRIL 1952. A STUDY OF THE CHARACTERISTICS OF THE INDIVIDUAL AND COMBINED WASTES OF A KRAFT PULP AND PAPER MILL.
Industrial waste survey rept.,
Virgil A. Minch. 10 Apr 52, 101p

Descriptors: (*Paper industry, Water pollution), (*Water pollution, *Industrial wastes), (*Florida, Water pollution).
Identifiers: *Panama City (Florida), *Water quality data.

The survey was undertaken as part of the U.S. Public Health Service program of industrial waste studies for the purpose of determining volume and characteristics of liquid wastes resulting from various manufacturing processes. The primary objectives of the study were to obtain original and additional data to supplement existing information on individual and combined wastes of a kraft pulp and paper mill at Panama City, Fla. Information obtained from this study is to be combined in an unidentifiable manner with data obtained from similar mills in the preparation of an industrial waste guide.

PB-215 661
Georgia U.niv., Athens.
IDENTIFICATION OF LEADERS, AND THEIR INVOLVEMENT IN THE PLANNING PROCESS,
Harold L. Nix. 1970, 55p PHS-Pub-1998
Contract PH-86-67-162

Descriptors: (*Public health, *Leadership), (*Community relations, *Environmental engineering), Management, Personnel selection, Identifying, Community development, Planning, Social psychology, Project planning.
Identifiers: Leader identification.

The basic purposes of this part of the BCEM series on community organization for participation in health efforts are to generalize about the nature of the community and community leadership, to describe a way to identify community leaders, and to discuss some guidelines for involving community leaders in supporting health or other community planning-action programs.

PB-215 662
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN LOS ANGELES AIR QUALITY CONTROL REGION.
Air Pollution rept.

Nov 68, 82p APTD-1211

Descriptors: (*Air pollution, *California).
Identifiers: *Air quality data, *Los Angeles (California).

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the metropolitan Los Angeles area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-215 663
Federal Water Pollution Control Administration, Washington, D.C.
PROCEEDINGS OF CONFERENCE ON POLLUTION OF THE NAVIGABLE WATERS OF THE PENOBSCOT RIVER AND UPPER PENOBSCOT BAY AND THEIR TRIBUTARIES, HELD IN BELFAST, MAINE, 20 APRIL 1967.

20 Apr 67, 413p

Descriptors: (*Penobscot River, *Water pollution), (*Maine, Water pollution), Penobscot Bay, Meetings.

The purpose of the conference is to bring together representatives of the State water pollution control agency, the United States Department of the Interior, and other interested parties to review the existing situation in Penobscot River, Maine, the progress which has been made, to lay a basis for future action by all parties concerned, and to give the State, localities, and industries an opportunity to take any indicated remedial action under State and local law. (Author)

PB-215 664
Federal Water Pollution Control Administration, Kansas City, Mo. Missouri Basin Region.
WATER QAULITY CONTROL STUDY LOWER SHOSHONE RIVER BASIN WYMONING.
Feb 68, 41p

Descriptors: (*Shoshone River Basin, *Water pollution), (*Yellowtail Reservoir, Water pollution), (*Bighorn River, Water pollution).

The purpose of the study is to evaluate the probable effect of the proposed project on water quality in the lower Shoshone River Basin and in Yellowtail Reservoir on the Bighorn River; to ascertain the benefits or damages resulting from changes in water quality; to assess the suitability of the water for proposed water uses; and, to determine water quality control needs. The study area includes the lower Shoshone River Basin in Park and Big Horn Counties in Wyoming and a portion of the Bighorn River Basin in Big Horn County, Wyoming and Big Horn County, Montana. (Author)

PB-215 665
Washington Univ., Seattle. Coll. of Engineering.
UTILIZATION OF FREE AND COMBINED AMINO ACIDS BY ACTIVATED SLUDGE,
Dale A. Carlson. Jun 65, 138p
Grant PHS-WP-00247

Descriptors: (*Activated sludge process, Biodeterioration), (*Proteins, *Biodeterioration), Deoxyribonucleic acids, Sludge, Amino acids.

The research is concerned with utilization of nitrogen in the form of amino acids both singly and bound together in peptides and proteins. Such proteinaceous materials comprise the major nitrogen fraction in domestic sewage and, hence, studies on optimum conditions required for high rate biological utilization of proteins can be useful in the design of more efficient biological treatment facilities for the removal of nitrogen from waste waters. The study was concerned first with the utilization of individual amino acids as separate entities, then as components of di- and tri-peptides, and finally as components of keratins--a protein type very resistant to degradation. Auxiliary topics covered are: (a) modification of Burton's DNA test for use with the mixed cultures of activated sludge. (DNA was used as a measure of new cell production) (b) development of a graphical digital computer program for evaluating and presenting Warburg respirometric data and (c) development of a KWIC program for retrieval and storage of literature pertinent to the project.

PB-215 666
Public Health Service, Cincinnati, Ohio.
AIR RESOURCE MANAGEMENT PROGRAM FOR SOUTHWESTERN OHIO-NORTHERN KENTUCKY.
Mar 67, 52p

Descriptors: (*Air pollution, *Kentucky), (*Air pollution, *Ohio), Regional planning.

The primary purpose of the report is to assist the citizens and governments of southwestern Ohio and northern Kentucky (SWO-NK) in understanding the nature of their air pollution problem and in developing a course of action - an air resource management program - to assure desirable air quality both now and in the future. The report also presents a general discussion of the air pollution problem in the SWO-NK area and applies to it the ideal methodology for solving the problem, the air resource management concept. Various aspects of the air pollution problem are summarized from Technical Committee reports to provide background for the program proposal. The current status of control efforts is also covered.

PB-215 667
Public Health Service, Portland, Oreg. Region IX.
THE SOCIAL AND ECONOMIC ASPECTS OF WATER RESOURCE QUALITY CONTROL,
Edward F. Eldridge. Nov 62, 162p
Proceedings of the Pacific Northwest Symposium on Water Pollution Research (11th), Portland, Oreg. 8-9 November 62.

Descriptors: (*Water pollution, *Meetings), Socioeconomic status.

Contents:
- The water quality problem -- policies, concepts and research needs;
- Social factors in water-resource quality-control policies and programs;
- Economic base survey -- A tool for resource management;
- Economic analysis in water quality management;
- Public awareness and information;
- Social and economic aspects of the relation of land use to water quality;
- Relationship of water quality to multiple-purpose water resource development;
- Inter-agency relationships in water resource development;
- Comprehensive planning for water quality control.

PB-215 668
Engineering Science, Inc., Oakland, Calif. Research and Development Lab.
TOXICANT-INDUCED BEHAVIORAL AND HISTOLOGICAL PATHOLOGY. A AUANTITATIVE STUDY OF SUBLETHAL TOXICATION IN THE AQUATIC ENVIRONMENT.
Final rept. 1962-63,
Harvey F. Ludwig. 19 Aug 64, 133p

Descriptors: (*Indicator species, Water pollution), (*Water pollution, *Aquatic animals), (*Toxicology, Water pollution), Ecology, Toxic tolerances, Histology, Pathology, Animal behavior, Avoidance responses, Bioassay, Contamination.
Identifiers: *Water pollution effects (Animals).

Research efforts have centered on behavioral pathology resulting from microchemical toxication of fishes, the quantification of which has proved to be an analytical tool of great sensitivity. For example, behavioral aberrations have been recorded in goldfish exposed to Toxaphene at 0.44 micro gm/l or 25 times greater than that producing behavior aberrations. The various experimental results presented for 264 hours. The 96 hour TL (m) under the same experimental conditions was 11.0 micro gm/l or 25 times greater than that producing behavior aberrations. The various experimental results presented herein are believed to demonstrate some of the potential of this approach in quantifying the effects of sublethal concentrations of water contaminants.

PB-215 669
Knittel (Robert E.)
ORGANIZATION OF COMMUNITY GROUPS IN SUPPORT OF THE PLANNING PROCESS AND CODE ENFORECEMENT ADMINISTRATION,
Environmental health service series,
Robert E. Knittel. 1970, 74p PHS-Pub-1997
See also PB-215 661

Descriptors: (*Communities, *Organizations), (*Leadership, Communities), Management planning.

Although the following report uses residential environmental code enforcement as a program for illustrative purposes, the community environment management administrator can easily recognize the application of the techniques and the strategies that are suited to his other programs. The case material used was chosen because it allowed description of community organization work at all levels from the neighborhood to the whole metropolitan area. This manual was written to give government program administrators a basic understanding of community organizations: their types, dynamics, organization, and leadership, and the part they play in community conflicts.

PB-215 670
Federal Water Pollution Control Administration, Metuchen, N.J. Northeast Region.
REPORT FOR THE CONFERENCE ON POLLUTION OF RARITAN BAY AND ADJACENT INTERSTATE WATERS. THIRD SESSION. VOLUME I. PROJECT STUDIES AND RESULTS.
May 67, 136p

Descriptors: (*Raritan Bay, *Water pollution), (*New Jersey, Water pollution).

In 1961 the Surgeon General of the Public Health Service, called a conference on the pollution of the interstate waters of Raritan Bay and adjacent waters. As a result of this conference the Public Health Service established the Raritan Bay Project to undertake a study of these waters to provide scientific data on which further pollution control programs could be established. The report presents results of the Raritan Bay Project.

PB-215 671
Public Health Service, New York. North Atlantic Drainage Basins Office.
DELAWARE RIVER BASIN. ZONE 1. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION CONTROL.
Water pollution series.
Jan 54, 112p PHS-WPS-63
Prepared in cooperation with New Jersey State Dept. of Health Water Pollution Control Board, New York State Dept. of Health Sanitary Water Board, and Pennsylvania Dept. of Health Interstate Commission.

Descriptors: (*Delaware River, *Water pollution).

The report describes the status as of January 1954 of the comprehensive water pollution control programs in that portion of the drainage area contributory to Zone 1 of the Delaware River. It sets forth information about the ways the water resources of the area are used, the pollution entering those water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, pollution prevention measures in effect, and those which appear to be needed. Its scope is limited to surface water pollution control.

PB-215 672
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
EFFECTS OF POLLUTION ON AQUATIC LIFE RESOURCES OF THE SOUTH PLATTE RIVER BASIN IN COLORADO. VOLUME II. TECHNICAL APPENDIX.
Rept. for Jul 63-Jan 67.

Dec 67, 93p PR-11a
Prepared in cooperation with Technical Advisory and Investigations Branch, Cincinnati, Ohio.

Descriptors: (*Platte River Basin, *Biological surveys), (*Colorado, *Water pollution), Chemical composition.

The report contains the various biological samples taken for the biological studies in the South Platte River Basin during the period from July 1963 through January 1967.

PB-215 673
Public Health Service, Cincinnati, Ohio. Bureau of Prevention and Environmental Control.
WATER METALS NO. 4, STUDY NUMBER 30. REPORT OF A STUDY CONDUCTED BY ANALYTICAL REFERENCE SERVICE.
Environmental Health Series,
Earl F. McFarren, John H. Parker, and Raymond J. Lishka. 1968, 128p
Report on Urban and Industrial Health.

Descriptors: (*Metals, *Water analysis), (*Trace elements, Water analysis), (*Spectrochemical analysis, Trace elements), (*Atomic spectroscopy, Trace elements), Standards, Accuracy, Statistical analysis.
Identifiers: *Water pollution detection.

In the study, three samples containing between 0.005 and 5.0 mg per liter of each of nine metals - zinc, chromium, copper, magnesium, manganese, silver, lead, cadmium, and iron - were provided. Each participant was requested to do a single analysis for each of the metals in each of the three samples by the provided atomic absorption spectrophotometric method. This method, depending upon the sensitivity of the instrument (burner, tube, etc.) available, gave the participant a choice of aspirating the sample directly into the flame or of chelating with ammonium pyrrolidine dithiocarbamate and extracting into methyl isobutyl ketone before aspirating. The results obtained were evaluated in terms of whether the sensitivity of the method was sufficient to permit the measurement of the metal with a reasonable degree of precision and accuracy at the concentration prescribed by the drinking water standards.

PB-215 674
Public Health Service, Cincinnati, Ohio. Bureau of Disease Prevention and Environmental Control.
WATER PESTICIDES NO. 2, STUDY NUMBER 31. REPORT OF A STUDY CONDUCTED BY ANALYTICAL REFERENCE SERVICE.
Environmental health series,
Raymond J. Lishka, John H. Parker, and Earl F. McFarren. 1968, 90p
Report on Urban and Industrial Health.

Descriptors: (*Gas chromatography, *Pesticides), (*Water analysis, *Insecticides), Chlorine organic compounds, Standards, Accuracy, Statistical analysis.
Identifiers: *Water pollution detection, Aldrin, DDE pesticide, DDT, Dieldrin, Endrin, Heptachlor, Lindane, Methoxychlor.

The report gives the results of a study in which dilute solutions of mixtures of chlorinated hydrocarbon pesticides were analyzed by electron capture gas chromatography. Lindane, heptachlor, aldrin, heptachlor epoxide, and o,p' - DDT can be measured with acceptable accuracy at a concentration of 0.1 microgram/liter. Dieldrin, p,p' - DDE, p,p' - DDT, endrin, and methoxychlor appear to be more troublesome.

PB-215 675
Public Health Service, Cincinnati, Ohio. Bureau of Disease Prevention and Environmental Control.
WATER SURFACANT NO. 3, STUDY NUMBER 32. REPORT OF A STUDY CONDUCTED BY ANALYTICAL REFERENCE SERVICE.
Environmental health series,
Raymond J. Lishka, and John H. Parker. 1968, 59p
Report on Urban and Industrial Health.

Descriptors: (*Surfactants, *Water analysis), Standards, Accuracy, Statistical analysis, Methylene blue.
Identifiers: *Water pollution detection.

In the study each participant was shipped three sterilized water samples in disposable 1-quart polyethylene containers. Sample 1 was composed of filtered river water containing 2.94 mg/liter linear alkylsulfonates (LAS). Sample 2 was tap water containing 0.48 mg/liter LAS. Sample 3 was distilled water containing 0.27 mg/liter LAS. A small amount of methylene blue and a copy of the procedure were sent with the samples. The data indicate no difference in methylene blue obtained from many different suppliers. Results from 111 analysts show good accuracy and precision for all samples.

PB-215 676
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
FOOD PESTICIDES NUMBER 2. REPORT OF A STUDY CONDUCTED BY THE ANALYTICAL REFERENCE SERVICE.
Environmental health series: Food protection,
Raymond J. Lishka, and Earl F. McFarren. 1966, 76p PHS-Pub-999-FP-6, PHS-ARS-Study-25
Report of a study conducted by the Analytical Reference Service.

Descriptors: (*Milk, Chemical analysis), (*Insecticides, *Chemical analysis), (*Food contamination, Milk), Accuracy, Standards.

In the study, 41 participating laboratories were instructed to analyze two solutions of ethyl acetate containing different mixtures of lindane, heptachlor epoxide, DDE, and dieldrin both before and after dilution with canned evaporated milk supplied with the sample. This was done to compare various techniques and ascess their accuracy. Gas chromatography with a microcoulometric titration was used by one participant, and the electron capture detector was used by 38 participants; thin-layer and paper chromatography were each used by one participant. Most participants achieved separation of pesticides either by use of a florisil clean-up column or a gas chromatograph column containing a mixture of a polar and a nonpolar liquid phase, or by use of both techniques. (Author Modified Abstract)

PB-215 677
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
APPLICATION OF SPECTRAL ANALYSIS TO STREAM AND ESTUARY FIELD SURVEYS. I. INDIVIDUAL POWER SPECTRA.
Environmental Health Series,
T. A. Wastler. Nov 63, 36p PHS-Pub-999-WP-7

Descriptors: (*Water pollution, Sampling), Power spectra, Diurnal variations, Statistical analysis.
Identifiers: *Water pollution sampling.

The application of spectral analysis techniques to sanitary engineering stream and estuary studies is discussed from a practical operational viewpoint. Techniques of interpretation and the data requirements are emphasized rather than the mathematical basis and details of the technique. The usefulness of spectral analysis in analyzing records obtained from continuous, automatic monitoring stations is pointed out. Spectral analyses applied to tidal height records and dissolved oxygen records obtained in a field study of the Potomac Estuary are discussed. The discussion is limited to the application of individual power spectra computation to sanitary engineering investigations. (Author)

PB-215 678
Federal Water Pollution Control Administration, Boston, Mass. Northeast Region.
CLEAN WATER. NATIONAL ESTUARINE POLLUTION STUDY.

1968, 150p
Proceedings of the Public Meeting Held at Wilmington, Delaware, June 27, 1968, and Written Statements Concerning Tidal Waters of the Delaware Coast and the Delaware River Estuary.

Descriptors: (*Delaware River Estuary, *Water pollution), (*Delaware, Water pollution), (*Estuaries, Water pollution).

The report presents the proceedings of the public meeting held at Wilmington, Delaware, June 27, 1968 and written statements concerning tidal waters of the Delaware coast and the Delaware River Estuary.

PB-215 679
Federal Water Pollution Control Administration, Washington, D.C.
SUMMARY OF WATER QUALITY STANDARDS FOR THE INTERSTATE WATERS OF MONTANA.
Aug 69, 21p
Prepared in cooperation with the Montana State Water Pollution Control Council, Helena.

Descriptors: (*Montana, *Water pollution), Standards.
Identifiers: *Water pollution standards.

During the period of 1958 to 1965 Montana adopted water quality standards for all waters of the State. The standards consist of three major components: designation of the uses which interstate waters are to serve, specification of narrative and numerical criteria to protect and enhance water quality, and specification of a plan of implementation and enforcement, which includes treatment and control requirements for municipal, industrial, and other wastes discharged to or effecting interstate waters. These components are discussed.

PB-215 680
Federal Water Pollution Control Administration, Cincinnati, Ohio. Div. of Pollution Surveillance.
TRACE METALS IN WATERS OF THE UNITED STATES. A FIVE YEAR SUMMARY OF TRACE METALS IN RIVERS AND LAKES OF THE UNITED STATES (OCTOBER 1, 1962-SEPTEMBER 30, 1967),
John F. Kopp, and Robert C. Kroner. 1967, 212p

Descriptors: (*Water pollution, *Trace elements), United States, Metals, Tables (Data), Boron, Barium, Strontium, Zinc, Iron, Copper, Manganese, Aluminum, Lead (Metal), Chromium, Molybdenum, Nickel, Silver, Cadmium, Beryllium, Cobalt, Vanadium, Arsenic.
Identifiers: *Water quality data.

The data presented in this publication were obtained over a five-year period, October 1, 1962-September 30, 1967 and represent over 1,500 samples collected from over 130 sampling stations. Of the nineteen elements routinely sought, boron, barium and strontium occurred with a frequency of over 98%. Zinc, iron and copper were found quite frequently, being observed in about 75% of the samples. Manganese was slightly less frequent at 51%. Aluminum, lead, chromium, molybdenum and nickel varied between 16 and 33%. Cadmium, beryllium, silver, cobalt, vanadium and arsenic were detected at measurable levels in less than 7% of the samples. (Author)

PB-215 681
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SEWAGE AND WATER WORKS CONSTRUCTION, 1961.
Annual rept.

1961, 17P PHS-Pub-758

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts).
Identifiers: *Sewage treatment plants.

The data published herein provides a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. The publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved.

PB-215 682
Federal Water Pollution Control Administration, College, Alaska. Alaska Water Lab.
IMMEDIATE POLLUTION CONTROL NEEDS IN ALASKA.

Apr 67, 179p

Descriptors: (*Alaska, *Water pollution), Cost estimates.

The purpose of this report is to summarize the immediate, known pollution control needs of Alaska. It is the first step in a comprehensive program to clarify the relationship of wastes disposal to the economy and environment of Alaska.

PB-215 683
National Center for Urban and Industrial Health, Arlington, Va. Injury Control Program.
DRIVER LICENSING GUIDELINES FOR MEDICAL ADVISORY BOARDS RELATING FUNCTIONAL ABILITY TO CLASS OF VEHICLE,
Michael S. Stock, William O. Light, Frederic D. Burg, and John M. Douglass. 1969, 38p PHS-Pub-1996

Descriptors: (*Licenses, *Motor vehicles), Medical examination.
Identifiers: *Drivers licenses.

Responsibility for licensing motor vehicle operators rests with state motor vehicle departments. Licensing administrators rely heavily on recommendations from medical advisors in problem cases where questions arise as to whether physical or mental impairments of an individual would make him an unacceptable risk as a driver on public highways. The functional criteria selected are common to several different disease entities or impairments. For the purpose of these guidlines, subdivisions of functional level have been grouped within the seven of the relationship between the type of license and the functional ability required for the three classes of licenses, recommended license limitations are given, in tabular form where feasible.

PB-215 684
Bi-State Development Agency, St. Louis, Mo.
MISSISSIPPI RIVER WATER POLLUTION INVESTIGATION. ST. LOUIS METROPOLITAN AREA.

1954, 378p

Descriptors: (*Mississippi River, *Water pollution), (*Missouri, Water pollution), Tables (Data).
Identifiers: *Saint Louis (Missouri), *Water quality data.

The survey carried on during the period 1951-52, covers the stretch of river between Alton Dam and Jefferson Barracks Bridge and includes the collection of river water samples for physical, chemical, and bacteriological examination; studies pertaining to the biological life in the stream; study of hydrometric data; determination of the sources and magnitude of the pollution loading from the area; and the collection of data relative to uses of the water resources.

PB-215 685
Federal Water Pollution Control Administration, Athens, Ga. Southeast Water Lab.
TEMPERATURE STUDIES, LOWER BISCAYNE BAY, FLORIDA,
L. B. Tebo, Jr., R. L. Estes, and R. R. Lassiter.
Oct 68, 92p

Descriptors: (*Biscayne Bay, *Water pollution), (*Nuclear power plants, Water pollution), (*Florida, Water pollution), Heat, Temperature measurement.
Identifiers: *Thermal pollution, *Baseline measurements, *Dade County (Florida), *Water quality data.

Florida Power and Light Company is presently operating two fossil fuel power generating units at its Turkey Point Plant adjacent to Lower Biscayne Bay in Dade County, Florida. The Company plans to place two nuclear powered facilities in operation at the same site by 1971 or 1972. To obtain background data on Bay temperature prior to installation of the nuclear facilities and to determine the temperature effect on the Bay of heated effluent from the existing facilities, thermal studies of Lower Biscayne Bay were conducted from April through August, 1968.

PB-215 686
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
REMOVAL OF BIOCHEMICALLY RESISTANT COMPOUNDS BY ADSORPTIONS-III.
Final technical rept.,
J. Carrell Morris, and Walter J. Weber, Jr. Aug 64, 106p PH-44-7012-2
Contract SAph-76295

Descriptors: (*Activated carbon treatment, *Organic compounds), (*Sewage treatment, Activated carbon treatment), (*Fluidized bed processing, Activated carbon treatment).
Identifiers: *Water pollution control.

The report is the third and final report on research in the Division of Engineering and Applied Physics at Harvard University undertaken to obtain information on the possible removal of organic pollutants from waste waters and incidentially from polluted natural waters by adsorptive processes. The topics discussed include the following subjects: Adsorption in fluidized columns of activated carbon; Adsorption of organic pesticides on carbon; and Examination of effluents from activated-carbon columns.

PB-215 687
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
UPGRADING EXISTING WASTEWATER TREATMENT PLANTS,
John M. Smith, Arthur N. Masse, and Walter A. Feige. 1972, 15p

Descriptors: (*Sewage treatment, Upgrading).

It is estimated that an investment of 18.1 billion dollars will be required for the construction of municipal wastewater treatment facilities in the United States to meet the projected 1976 Federal State Water Quality Standards (1). Approximately one fourth of this amount will be used for upgrading the performance of the existing wastewater treatment facilities. The application of todays technology in upgrading plant performance includes (a) techniques that can be used to maintain the original treatment plant efficiency under increasing organic and/or hydraulic loading, (b) the addition of processes that can be used to increase overall plant removal efficiencies and (c) process additions or modifications for specific contaminant removal. Physically, these upgrading procedures may be applied ahead of the plant; as modifications of the treatment process itself; or as effluent polishing techniques. The report describes these upgrading procedures.

PB-215 688/3
Ionics, Inc., Watertown, Mass.
HYPOCHLORITE GENERATOR FOR TREATMENT OF COMBINED SEWER OVERFLOWS.
Water pollution control research series,
Frank B. Leits, Steven A. Michalek, and John L. Greatorex. Mar 72, 91p EPA-11023-DAA-03/72
Contract DI-14-12-490
Paper copy available from GPO $1.00 as EPI.16.11023-DAA-03/72

Descriptors: (*Sewage treatment, Disinfection), (*Disinfection, *Overflows), (*Electrolytic cells, *Gas generators), Combined sewers, Sodium hypochlorite, Operating costs, Design, Capitalized costs, Ion exchange membrane electrolytes, Process variables, Performance evaluation.
Identifiers: *Water pollution control.

An advanced electrolytic generator has been developed for on-site production of sodium hypochlorite for disinfection of overflows from combined sewer systems. In this system an electrochemical cell electrolyzes sodium chloride brine to chlorine gas and sodium hydroxide solution, which are reacted immediately outside the cell to produce a 5 to 10% sodium hypochlorite solution. Significant advances in safety and economy have been realized by use of a hydraulically impermeable cation exchange membrane. The most critical components have operated for over 3000 hours with no deterioration of performance. The generator requires 1.6 KWH of electricity and 2.1 pounds of salt per pound of sodium hypochlorite. The operating cost for systems larger than 500 pounds of hypochlorite per day is projected to be 3 to 4 cents per pound of hypochlorite. (Author Modified Abstract)

PB-215 689
Federal Water Pollution Control Administration, Cincinnati, Ohio.
THE SANTEE RECREATION PROJECT, SANTEE, CALIFORNIA.
Water pollution control research series (Final),
John C. Merrell, Jr., William F. Jopling, Roderick F. Bott, Albert Katko, and Herbert E. Pintler.
1967, 174p WP-20-7

Descriptors: (*Santee Lakes, *Water quality), (*California, Recreational facilities), Water reclamation.

The report presents the results of a study of the Santee, California recreational lakes, which were deliberately planned to utilize the community's reclaimed sewage effluent. By the summer of 1965, a special basin adjacent to one of the lakes was supplied with reclaimed water and used for swimming. A seven-agency cooperative study evaluated the content of waste water passed through conventional secondary treatment processes, the sand filtration, and the recreational lakes. No health hazards were demonstrated by the viral or other findings, and this fact had considerable impact in the promotion of public acceptance of the use of the recreational facilities.

PB-215 690
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
LUCKY PEAK RESERVOIR 1965, WATER QUALITY DATA REPORT.
Jan 66, 41p Working Paper-57

Descriptors: (*Lucky Peak Reservoir, *Water pollution), (*Idaho, Water pollution).

The report contains tabulations of water quality data collected in 1965 during the cooperative surveys on Lucky Peak Reservoir.

PB-215 691
Nassau County Dept. of Public Works, N.Y.
REPORT ON WATER RECLAMATION.
Progress rept., 1 Jan 65-1 Jan 66,
Herbert J. Simins, and John H. Peters. Apr 66, 52p
Grant WPD-71-01

Descriptors: (*Sewage disposal, *Ground water recharge), (*Injection wells, Sewage disposal), Salt water intrusion, New York.
Identifiers: *Nassau County (New York), *Liquid waste disposal.

In Nassau County, New York, it is estimated that 27 million gallons a day of fresh water is flowing out to waste to sea from the south watershed. A barrier injection line utilizing renovated water along the south shore of the County would prevent the escape of this 27 million gallons a day and also supply the alternate flow which would maintain the fresh-salt water interface and prevent salt water intrusion. By the creation of this hydrologic dam, the 27 million gallons a day of fresh water thus made available could be utilized for additional water supply. The report discusses laboratory bench studies and model unit studies to determine parameters for a larger 400 gpm tertiary treatment pilot plant.

PB-215 692
Federal Water Pollution Control Administration, Athens, Ga. Southeast Water Lab.
A REPORT ON THE WATER QUALITY OF CHARLESTON HARBOR AND THE EFFECTS THEREON OF THE PROPOSED COOPER RIVER REDIVERSION.

Jun 66, 135p
Report on Charleston Harbor Water Quality Study.

Descriptors: (*Charleston Harbors, *Water pollution), (*North Carolina, Water pollution).
Identifiers: *Water quality data.

The purpose of the study was to investigate the effects of the proposed Cooper River rediversion on the water quality in Charleston Harbor. The scope of the study was to determine the existing water quality as measured by various bacteriological, biological, chemical and physical parameters; and investigation of the effects of interactions of these parameters on environmental changes; and a prediction of the response of the water quality to the proposed reduction of fresh water inflow. The area of study included the lower reaches of the Ashley, Cooper, and Wando Rivers, the harbor area between these tributaries, and the harbor entrance. (Author Modified Abstract)

PB-215 693/3
Metcalf and Eddy, Inc , Boston, Mass.
NITRIFICATION AND DENITRIFICATION FACILITIES.
Harry E. Wild, Jr., Clair N. Sawyer, and Thomas C. McMahon. Jul 71, 56p
Presented at Design Seminar for Wastewater Treatment Facilities, Dallas, Tex., 27-28 Jul 71.

Descriptors: (*Nitrogen, *Chemical removal (Sewage treatment)), (*Sewage treatment, Chemical removal (Sewage treatment)), (*Nitrification, Sewage treatment), Ammonia, Design criteria, Activated sludge process, Bacteria, Aeration, Process variables, Aeration.
Identifiers: *Water pollution control, *Denitrification, Nitrosomonas, Nitrobacter, Secondary sewage treatment.

The report discusses process variables such as temperature, pH, BOD, and ammonia concentrations associated with the removal of nitrogen from sewage effluent and describes design criteria for the layout of wastewater treatment facilities employing a nitrogen removal cycle.

PB-215 694/1
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
AN INVESTIGATION OF TECHNIQUES FOR REMOVAL OF CHROMIUM FROM ELECTROPLATING WASTES.
Final rept.,
G. R. Smithson, Jr. Mar 71, 98p EPA-WQO-12010-EIE-03/71
Grant WPRD-201-10-68

Descriptors: (*Activated carbon treatment, Chromium), (*Water pollution, *Chromium), (*Electroplating, Industrial waste treatment), (*Industrial waste treatment, *Metal finishing), Flotation, Solvent extraction, Operating costs, Capitalized costs.
Identifiers: *Water pollution control.

The report describes work on the removal of hexavalent chromium from plating rinse waters employing various treatment processes. Information was sought by questionnaire and by waste water analyses on the type of waste produced by smaller electroplating plants. Laboratory studies were conducted on several nonconventional methods for treatment of these wastewaters including ion flotation, adsorption on activated carbon, and solvent extraction. A demonstration pilot-plant study also was conducted on the activated carbon process employing actual rinse waters from a hard chrome plating operation. The results of the various phases of the study indicated that activated carbon adsorption for chromium removal may have practical application in many small plating plants.

PB-215 695/8
Rex Chainbelt, Inc., Milwaukee, Wis. Ecology Di...
SCREENING/FLOTATION TREATMENT OF COMBINED SEWER OVERFLOWS.
Water pollution control research series,
Donald G. Mason, and Mahendra K. Gupta. Jan 72, 173p EPA-11020-FDC-01/72
Contract DI-14-12-40
Paper copy available GPO $1.50 as EP1.16:11020F 01/72.

Descriptors: (*Flotation, Overflows), (*Disinfection, Overflows), (*Size screening, Overflows), (*Sewage treatment, *Overflows), Combined sewers, Chlorination, Ultraviolet radiation, Flocculating, Biochemical oxygen demand, Design, Capitalized costs, Operating costs, Performance evaluation, Oxidation, Ozone.
Identifiers: *Water pollution control.

The report documents a study to develop a treatment system for combined sewer overflows. The processes of chemical oxidation, screening, dissolved-air flotation, and disinfection were evaluated in the laboratory. A 5 MGD demonstration system was designed, installed and evaluated. Suspended solids and volatile suspended solids removal in the range of 65-80% were consistently obtained at influent concentrations of 150 to 600 mg/l. BOD and COD removals were slightly lower at 55 to 65% for influent concentrations of 50 to 500 mg/l. Addition of chemical flocculents (ferric chloride and a cationic polyelectrolyte) was necessary to obtain these removals. Without the use of chemical flocculents, removal of BOD, COD, suspended solids, and volatile suspended solids were all in the range of 40-50%. The screening flotation system provided sufficient detention time (difference 15 minutes) for adequate disinfection with hypochlorite salts. Cost estimates are presented.

PB-215 697/4
Volco Brass and Copper Co., Kenilworth, N.J.
BRASS WIRE MILL PROCESS CHANGES AND WASTE ABATEMENT, RECOVERY AND REUSE.
Water pollution control research series,
Leslie E. Lancy, and Charles A. Forbes. Nov 71, 47p EPA-12010-DPF-11/71
Paper copy available from GPO $0.55 as EP1.16:12010DPF-11/71.

Descriptors: (*Metal finishing, *Industrial waste treatment), (*Materials recovery, *Copper), (*Water pollution, Pickling compositions), (*Pickling compositions, Materials recovery), Brasses, Process charting, Chemical cleaning, Hydrogen peroxide, Sulfuric acid, Electrolysis, Water reclamation, Wire processing, Capitalized costs, Operating costs, Sludge disposal.
Identifiers: *Metal recycling, Waste water reuse, *Water pollution control.

The report describes process changes and waste treatment, recovery, and reuse facilities installed by Volco Brass and Copper Company, Kenilworth, New Jersey. The plant produces 75 tons of wire per day. An electrolytic system was installed to recover copper from the spent primary pickle solution and to regenerate the sulfuric acid for reuse. A hydrogen peroxide bright pickle replaced the chromate and fluoride bright pickles previously used. Copper from the bright pickle is also recovered in the electrolytic system. The electrolytic copper is reused on location in casting. An integrated copper treatment system was installed to treat bright pickle drag-out. Sludge from the integrated system is recovered for sale. Rinse water consumption was reduced from 150 gpm to 10 gpm. Former discharges of chromium, ammonium, and fluoride ions have been eliminated. Cost and operating data and effluent analyses are presented. (Author)

PB-215 698
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
INVENTORY OF RESEARCH PROJECTS IN THE PACIFIC NORTHWEST.

1 Jan 69, 101p

Descriptors: (*Water pollution, Research).

The report provides a summary of research projects funded by the Federal Water Pollution Control Administration in the Pacific Northwest. The inventory includes research, development, demonstration, and training grants active as of December 31, 1968, and research fellowships active or awarded during the period of July 1, 1967 through December 31, 1968, in the States of Alaska, Idaho, Montana, Oregon, and Washington. The purpose of the summary is to facilitate interagency communication and to stimulate new inquiry into areas of research needing additional emphasis. (Author)

PB-215 699
Carollo (John) Engineers, Lafayette, Calif.
MARICOPA COUNTY. AN INTERIM REPORT ON A SOLID WASTE DEMONSTRATION PROJECT.
Interim rept.
1969, 329P
Grant PHS-UI-00039

Descriptors: (*Waste disposal, *Arizona), (*Regional planning, Waste disposal).
Identifiers: *Maricopa County (Arizona), *Solid waste disposal.

The project demonstrates how new or improved solid waste management techniques could solve a regional solid waste problem by developing a solid waste disposal system and plan for county-wide reference and use, and by developing a protocol and timetable for putting the plan into effect. Types and quantities of solid wastes now being produced in Maricopa County, Arizona, will be determined, and existing disposal methods identified. The interrelationship between current collection practices and disposal practices will be studied. Estimates of population growth to the year 2000, and parallel projected increases in solid waste production will be made.

PB-215 700
Federal Water Pollution Control Administration, Metuchen, N.J. Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project.
REPORT ON THE IMMEDIATE WATER POLLUTION CONTROL NEEDS FOR THE IN-

TERSTATE AND INTRASTATE WATERS OF THE METROPOLITAN NEW YORK REGION.

Jun 67, 94p
Includes Addenda.

Descriptors: (*New York, *Water pollution), (*New Jersey, *Water pollution).
Identifiers: *New York City Metropolitan Area.

The report reviews the water pollution problems in the metropolitan New York region, which includes the drainage basins of all streams entering the Hudson River south of the southern boundaries of Orange and Putnam Counties; entering and including Raritan, Newark and New York Bays; and entering the north side of Long Island Sound west of the Housatonic River Basin. The Region lies chiefly in New Jersey and New York, but includes a small portion of Connecticut. The discharge of waste from municipalities, industries and numerous other sources has degraded water quality and prevents full utilization of this natural resource throughout the region. The purpose of the report is to delineate the actions which should be undertaken immediately to prevent further degradation and to provide enhancement of these waters.

PB-215 701
Engineering-Science, Inc., Oakland, Calif. Research and Development Lab.
STATE-OF-THE-ART OF THE MICROSCREEN PROCESS.

Jul 70, 95p

Descriptors: (*Sewage treatment, Sewage filtration), (*Reviews, *Sewage filtration).
Identifiers: *Microscreening.

The objective of the study was to develop a microscreen model as a computer subroutine compatible with the executive program of the Federal Water Quality Administration. The goal for model development was that the model should enable one to predict microscreen performance when the process is used for treatment of secondary effluents as well as capital, operating, and maintenance costs associated with use of the process. A critical review of the solids removal mechanisms potentially operative in the microscreen process has been presented. The mechanisms examined include: mechanical screening; gravity settling; interception; impaction; Browian diffusion; molecular forces; electrostatic and electrokinetic forces; and chemical forces. The two primary design considerations have been the hydraulics and solids removal efficiency. Performance of specific microscreen installations have been tracked variously by : liquid balances; solids balances; screen and solids character; and screen loading rates. (Author)

PB-215 702
Public Health Service, Dallas, Tex. Region VII.
WATER RESOURCES STUDY, COOPER RESERVOIR, SOUTH SULPHUR RIVER, TEXAS.

Jul 63, 36p

Descriptors: (*South Sulfur River, *Reservoirs), (*Texas, *Water resources), Forecasting, Cooper Reservoir.
Identifiers: *Delta County (Texas), *Hopkins County (Texas).

The report presents data and information relevant to the determination of municipal and industrial water supply and quality control requirements to the year 2065 for portions of the six-county area which can be reasonably served by the proposed Cooper Reservoir. The report also includes an estimate of the annual benefits which could be ascribed to storage allocated to both water supply and flow regulation for quality control.

PB-215 703
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY HOLLEY RESERVOIR, CALAPOOIA RIVER BASIN, OREGON.

Jun 67, 83p

Descriptors: (*Oregon, Water resources), (*Calapooia River, *Reservoirs), Holley reservoir.
Identifiers: *Linn County (Oregon).

The investigation was conducted to advise the Corps of Engineers on the need for and value of storage in Holley Reservoir Project, Linn County, Oregon, for municipal and industrial water supply and water quality control in the Calapooia Basin and that portion of the Willamette River below the mouth of the Calapooia. To accomplish this, available data on water uses, waste souces, and water quality were examined, evaluated, and projected. (Author)

PB-215 722/0
Manhattan Coll., Bronz, N.Y. Dept. of Civil Engineering.
CELLULOSE DEGRADATION IN COMPOSTING.
Final rept.,
Raymond Regan, John S. Jeris, Robert Gasser, Kevin McCann, and Joseph Hudek. Mar 73, 153p*
EPA-R3-73-029
Grant EP-00161

Descriptors: (*Waste disposal, Composts), (*Cellulose, *Biodeterioration), (*Composts, Cellulose), Microbiology, Design criteria, Performance evaluation, Refuse disposal, Oxygen, Nutrients, Temperature.
Identifiers: *Solid waste disposal, Oxygen requirements, Nutrient requirements.

The purpose of the research investigation was to determine the optimum environmental conditions for the degradation of refuse using the composting process. Shake flasks and Warburg studies were used to scan wide ranges of environmental parameters to locate optimum conditions for continuous studies in three bench scale composters of 1.5 cubic feet capacity each. Close control of the following parameters was maintained: temperature, air, moisture, pH, nitrogen, and phosphorus. Temperature and residual oxygen were monitored electronically while other analyses were performed periodically. Optimum values of various environmental parameters are given. Free air space is suggested as a universal parameter for composting solid wastes from various sources. The use of recycle especially under winter conditions, is recommended. Due to its resistance to biological degradation, cellulose, a major component of paper, should be recovered rather than composted. (Author)

PB-215 801/2
Conservation Foundation, Washington, D. C.
A CITIZEN'S GUIDE TO CLEAN AIR.

Jan 72, 92p*
Library of Congress catalog card no. 71-187901. Sponsored in part by Environmental Protection Agency, Washington, D. C.

Descriptors: (*Air pollution, *Legislation), (*Regulations, Air pollution), Reviews, Standards, Automobiles, Exhaust gases, Public law, Economic analysis, Financing, Government policies, Mass communication.
Identifiers: Air pollution standards, Citizen participation.

In 1970 the Conservation Foundation published Your Right to Clean Air, a manual designed to help citizens participate in air quality control processes. In the last days of 1970, government control procedures were changed radically when Congress attached major amendments to the Clean Air Act. The federal revisions make necessary corresponding changes in state and local programs. New time schedules have been set, accelerating the entire control process, and important new avenues have been opened for public participation in decisions affecting every community's air. This is why this new edition was written. Some of the topics include: The clean air amendments of 1970; The first steps in the federal process; Implementation plans; Standards of performance; Hazardous air pollutant standards; Auto emission controls The citizen's legal rights; Economic considerations; and The citizen's role in policy-making.

PB-215 824
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
WATER SUPPLY AND PLUMBING CROSS-CONNECTIONS. HAZARDS IN HOUSEHOLD AND COMMUNITY SUPPLY SYSTEMS. A MANUAL OF RECOMMENDED CONTROL PRACTICES, INCLUDING A RECOMMENDED ORDINANCE,
Marvin T. Skodje. 1963, 76p PHS-Pub-957
Paper copy available from Government Printing Office $0.40 as HE20.1108:P73.

Descriptors: (*Water supply, *Plumbing), (*Valves, Water supply).

Contents:
- Public health significance of cross-connections;
- Theory of backflow and backsiphonage;
- Methods and devices for backflow prevention;
- Testing procedures for backflow preventers;
- Protection of public water supply;
- Administration of a cross-connection control program;
- Cross-connection control ordinance.

PB-215 825
Public Health Service, Washington, D.C. Div. of Air Pollution.
AIR POLLUTION AND RESPIRATORY DISEASE,
Harry Heimann. 1964, 27p PHS-Pub-1257

Descriptors: (*Respiratory diseases, *Air pollution), Public health, Bronchitis, Emphysema, Asthma, Lungs, Malignant neoplasms, London.
Identifiers: Air pollution episodes, *Air pollution effects (Animals), Donora (Pennsylvania), New York City (New York).

It is a truism that the air we breathe is essential to our health and well-being. However, when that air is laden with extraneous substances--when there is air pollution--then, although still essential to our good health, the air can also produce undesirable health effects. In the discussion the authors shall consider only the recognizable manmade air pollutants. They consider only the effects on the health of man.

PB-215 826
Public Health Service, Washington, D.C. Bureau of State Services.
SOURCE MATERIALS ON WATER POLLUTION CONTROL. REVISED.
Bibliography series.

1958, 29P PHS-Pub-243-Rev, PHS-BS-22-Rev
Revision of report dated 1952.

Descriptors: (*Water pollution, *Bibliographies).

The bibliographic series as authorized by the Federal Water Pollution Control Act of 1956 contains information related to community action, finance, laws and regulations, industrial wastes, domestic wastes, standards, research, biological aspects of water pollution, and water supply.

PB-215 827
Public Health Service, Washington, D.C. Div. of Air Pollution.

A DIGEST OF STATE AIR POLLUTION LAWS, 1966 EDITION.
1966, 293p PHS-Pub-711-66
Prepared for National Conference on Air Pollution, Washington, D. C., 12-14 Dec 66. See also report dated 1967, PB-197 064.

Descriptors: (*Air pollution, *Law (Jurisprudence)), State government, Legislation.

The report contains air pollution laws of 1966 for the United States and territories.

PB-215 828
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SANITARY SIGNIFICANCE OF FECAL COLIFORMS IN THE ENVIRONMENT.
Water pollution control research series,
E. E. Geldreich. Nov 66, 130p WP-20-3

Descriptors: (*Water pollution, *Coliform bacteria), (*Indicator species, Coliform bacteria), Water analysis.
Identifiers: *Water pollution detection.

This compilation of previously published research papers by personnel of the Microbiological Activities, Basic and Applied Sciences Program, Cincinnati Water Research Laboratory, (Robert A. Taft Sanitary Engineering Center), brings together in one volume much of the information concerning fecal-coliform bacteria that has appeared in various scientific journals. The material is organized into seven chapters that include background; methodology; and occurrences in warm-blooded animals including man; fresh-water fish; vegetation and insects; and soil. The final section covers the interpretation and significance of fecal-coliform bacteria in water pollution studies. (Author)

PB-215 829
Pacific Northwest Water Lab., Corvallis, Oreg.
AERATED LAGOON TREATMENT OF FOOD PROCESSING WASTES,
Kenneth A. Dostal. Mar 68, 53p
FWQA-12060/03/68

Descriptors: (*Food processing, *Industrial waste treatment), (*Lagoons (Ponds), Industrial waste treatment).
Identifiers: *Aeration ponds, *Pea processing, *Water pollution control.

The report presents the data collected and the conclusions drawn from a six-week period of sampling of an aerated lagoon used to treat wastes from the frozen pea processing plant of Kelley-Farquhar located at Ferndale, Washington. Eleven hour composite samples were collected one day per week from July 6 to August 17, 1967, of the influent to the 5.6 million gallon aerated lagoon, effluent from the lagoon and effluent from a 135,000 gallon polishing pond. (Author)

PB-215 830
Federal Water Pollution Control Administration, Washington, D.C.
BUILDING FOR CLEAN WATER, 1965. A REPORT ON FEDERAL INCENTIVE GRANTS FOR MUNICIPAL WASTE TREATMENT AND FUTURE CONSTRUCTION NEEDS.

1965, 13p

Descriptors: (*Sewage treatment, *Grants).
Identifiers: *Sewage treatment plants.

Every city and town is responsible for cleaning up the pollution it creates. One objective of the Federal Water Pollution Control Act passed by Congress in 1956 and strongly amended in 1961 and 1965 was to help communities meet this responsibility. This law authorizing Federal grants to municipalities to assist them in the construction of sewage treatment works is discussed.

PB-215 831
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
ENVIRONMENTAL HEALTH PLANNING GUIDE.

1962, 67p, PHS-Pub-823

Descriptors: (*Public health, *Regional planning).

The report emphasizes the evaluation of health-related utilities and services which readily lend themselves to long-range planning, and deals primarily with water, sewerage, refuse, air pollution and housing programs. Health department inspectional services are covered only in the organizational sense, and reference is made to existing rating schedules for several of these vital services. The procedures described in the guide can be applied to an area as small as a town or as large as a metropolitan area, and are particularly suited for use in a county with several incorporated places and operating agencies.

PB-215 832
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
STATISTICAL SUMMARY OF MUNICIPAL WATER FACILITIES IN THE UNITED STATES, JANUARY 1, 1963,
Richard S. Green. 1965, 69p PHS-Pub-1039
See also rept. nos. PHS-Pub-301 and PHS-Pub-775.

Descriptors: (*Sewage treatment, *United States), (*Water treatment, *United States), Inventories, Water supply.
Identifiers: *Sewage treatment plants.

The report summarizes and analyzes data on community water supply and treatment facilities, based on the 1963 Inventory of Municipal Water Facilities. This is the fourth such study prepared by the Public Health Service. Comprehensive data are presented by States, community population size groups, and major drainage basins. For analytical and comparative purposes certain statistical data have been reproduced from the 1958 study. (Author)

PB-215 834
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
1962 INVENTORY: MUNICIPAL WASTE FACILITIES. REGION I. CONNECTICUT, MAINE, MASSACHUSETTS, NEW HAMPSHIRE, RHODE ISLAND, VERMONT.

1963, 76p PHS-Pub-1065-Vol-I

Descriptors: (*New England, *Water pollution), (*Sewage, Water pollution), Tables (Data), Inventories.
Identifiers: *Sewage treatment effluents.

The Inventory contains the latest available data for all sources of municipal pollution which are of significance in water pollution control programs for the six-state subject region. Following each state listing is a table showing sewage disposal facilities.

PB-215 835
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
PUBLIC SEWAGE TREATMENT PLANT CONSTRUCTION - 1953.

1954, 20p PHS-Pub-409

Descriptors: (*Sewage treatment, *Contracts).
Identifiers: *Sewage treatment plants.

The report on the construction of public sewage treatment plants for the calendar year 1953 supplements brings up to date the information contained in the 1952 construction report. It indicates the progress made by municipalities during 1953 in providing the sewage treatment facilities necessary to prevent pollution of water resources on which downstream water users depend. Basic data on water use and population and industrial growth, are given. (Author Modified Abstract)

PB-215 836
Public Health Service, Washington, D.C.
PROCEEDINGS OF ANNUAL CONFERENCE (1961) OF THE SURGEON GENERAL PUBLIC HEALTH SERVICE WITH STATE AND TERRITORIAL MENTAL HEALTH AUTHORITIES, 5--7 JANUARY 1961, WASHINGTON, D.C.

1961, 46p PHS-Pub-851

Descriptors: (*Mental disorders, *Public health).

The report contains talks presented at a conference on mental health. Also contained are group discussions and recommendations resulting from the discussions.

PB-215 837
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
AN INDUSTRIAL WASTE GUIDE TO THE POTATO CHIP INDUSTRY.
1961, 18p PHS-Pub-756

Descriptors: (*Food processing, *Industrial waste treatment), Industrial wastes.
Identifiers: *Potato processing, *Water pollution control.

The report, includes suggestions and procedures which chippers can employ to economically reduce or eliminate the wastes from their operations which may ultimately reach fresh water streams either through their own waste disposal and utilization facilities or through those owned and operated by governmental agencies. (Author)

PB-215 838
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
PLANKTON POPULATION DYNAMICS.
Rept. for 1 Jul 59-30 Jun 61,
Louis G. Williams. 1962, 95p PHS-Pub-663-Suppl-2

Descriptors: (*Plankton, *Biological surveys), (*Water quality, Plankton), (*Algae, Biological surveys).
Identifiers: *Water quality data.

The chemical, physical and biological characteristics of surface waters are interrelated phenomena. Making greater use of the stream biota to determine existing, and to forecast future, water quality in the stream offers promising possibilities. Plankton studies within the National Water Quality Network have included extensive work designed to permit application of the principle of diatom species diversity to the development of water quality indices. The studies required development of new laboratory analytical techniques, as well as preliminary application of the methodology to surface water samples from the many diverse Network sampling points. Published herein are data from samples collected in the 2-year period July 1959 through June 1961 at 65 of the Network stations.

PB-215 839
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A SURVEY OF AIR POLLUTION IN COMMUNITIES AROUND THE JOHN F. KENNEDY INTERNATIONAL AIRPORT.
Rept. for 24 Sep-24 Oct 64,
Melvin Nolan. Jun 66, 81p

Descriptors: (*Airports, Air pollution), (*New York, *Air pollution), Exhaust gases.

Identifiers: *John F. Kennedy International Airport, *Air quality data.

Prompted by complaints and public concern about the air pollution problem associated with jet-aircraft operations at John F. Kennedy International Airport, a study to evaluate the community air pollution problem attributable to aircraft operations was initiated. A 1-month study was conducted during September and October 1964 that included an odor survey, measurement of gaseous and particulate contaminants in the atmosphere, an emission inventory, and analyses of flight operations, meteorological conditions, and public complaint records.

PB-215 840
Federal Water Pollution Control Administration, Edison, N.J. Hudson-Delaware Basins Office.
REPORT ON THE QUALITY OF THE INTERSTATE WATERS OF THE LOWER PASSAIC RIVER AND UPPER AND LOWER BAYS OF NEW YORK HARBOR.

Nov 69, 135p CWT-10-15

Descriptors: (*New York, Water pollution), (*Hudson River, *Water pollution), (*Passaic River, *Water pollution), (*New York Harbor, Water pollution).
Identifiers: *New York City Metropolitan Area.

The report discusses the pollution and waste treatment facilities of the interstate waters of the lower Passaic River and upper and lower New York harbor.

PB-215 841
Federal Water Pollution Control Administration, Portland, Ore. Northwest Region.
PRESENT WATER USE INVENTORY SNAKE RIVER - MAIN STEM.

6 Jan 67, 84p
Report on Columbia River Basin Project.

Descriptors: (*Snake River, Utilization).

The report presents tables containing the uses of specific areas along the main stem of the Snake River. Such uses include fisheries, wildlife, recreation, water supply, aesthetics, irrigation, and hydroelectric power generation.

PB-215 842
Public Health Service, Washington, D.C. Bureau of State Services.
THE ROBERT A. TAFT SANITARY ENGINEERING CENTER, CINCINNATI, OHIO. A CENTER OF RESEARCH, INVESTIGATION AND TRAINING TO ASSIST STATES AND COMMUNITIES IN SOLVING PROBLEMS OF AIR, WATER AND FOOD CONTAMINATION.
1954, 23p PHS-Pub-354

Descriptors: (*Santiary engineering, Laboratories).
Identifiers: *Robert A Taft Sanitary Engineering Center.

The report describes a federal government operated laboratory established to evaluate health hazards relative to environmental pollution. Described are research programs, field investigations, and training facilities associated with the laboratory.

PB-215 843
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
NATIONAL SHELLFISH SANITATION PROGRAM: DEPURATION PLANT DESIGN.
Environmental health series: Food protection,
Santo A. Furfari. 1966, 125p PHS-Pub-999-FP-7

Descriptors: (*Shellfish, Decontamination), (*Food sanitation, Shellfish), (*Industrial plants, Shellfish), Seafood, Water pollution, Microorganisms, Design criteria, Food processing, Purification, Fisheries.
Identifiers: *Depuration plants.

Depuration is a process in which shellfish are held in a clean water environment for a time sufficient to permit them to free themselves of transient pollutional microorganisms through normal biological processes. The objectives of this report are to present the principles upon which the satisfactory depuration of shellfish depend and to establish guidelines for properly accomplishing a depuration program. The principal factors include the quantity and quality of sea water, time for depuration, construction of the plant, location and laboratory control. Plant operation guidelines are also presented.

PB-215 844
Bureau of Solid Waste Management, Cincinnati, Ohio.
DEVELOPING A STATE SOLID WASTE MANAGEMENT PLAN,
Richard O. Toftner. 1970, 56p BSWM-SW-42ts PHS-PUB-2031
Library of Congress Catalog Card no. 70-607466.
Paper copy available from GPO $0.60 as stock no. HE20.1408:M-31.

Descriptors: (*Waste disposal, *Regional planning), (*State government, Waste disposal), (*Government policies, Waste disposal), Management planning.
Identifiers: *Solid waste disposal.

The document describes basic features of the planning process and their utilization in the development of a state plan for its solid waste management. Purpose of the publication is to aid the various states in preparing comprehensive solid waste management plans. Intended for use by any state solid waste agency, the publication's specific applicability to any one unique situation is not necessarily assured; it is flexible enough, to serve any state in accordance with its own needs and special conditions. The following objectives: A sound planning process; Intergovernmental coordination; Application of techniques and knowledge from the best of organizational theory, and management sciences; Integration of the plan with areawide plans; and Development of sound action programs.

PB-215 845
Eimco Corp., Salt Lake City, Utah.
COMPOSTING DEWATERED SEWAGE SLUDGE.

1973, 35p BSWNSW-12c
Paper copy available from GPO $0.45 as HE20.1102:SE8. Library of Congress catalog card no. 73-603142.

Descriptors: (*Sludge disposal, *Composts), (*Waste disposal, Composts), Pilot plants, Design criteria.
Identifiers: *Solid waste disposal.

The test program described was designed to obtain the following basic information concerning the composting of a combination of primary and secondary dewatered sewage sludges: (1) effect of mixing; (2) effect of moisture content; (3) effect of recycling; (4) process capacity; (5) air requirements; (6) effect of chemicals used for conditioning the sludge for dewatering; (7) composition of off-gases; (8) destruction of pathogenic bacteria, fungi, nematodes, and viruses; and (9) chemical and physical composition of the final compost.

PB-215 846
Federal Water Pollution Control Administration, Washington, D.C.
A PRIMER ON WASTE WATER TREATMENT.

1973, 27p
Paper copy available from GPO $0.55 as EP2.2:W28/2.

Descriptors: (*Sewage treatment, Reviews).

The report, the methods used now and processes being developed for the future to treat municipal wastes are explained. This includes topics as: Secondary treatment; Lagoons and septic tanks; Coagulation-sedimentation; Adsorption; Electrodialysis; Bending of treated water; Chemical oxidation; Polymers and pollution; and Common sewage treatment terminology.

PB-215 847
Federal Water Pollution Control Administration, Washington, D.C.
THE ECONOMICS OF CLEAN WATER.
Summary rept.
Mar 70, 48p
Paper copy available from GPO $0.50 as I67.1/2:970.

Descriptors: (*Sewage treatment, *Economic analysis), Cost analysis, Financing, Industrial wastes.
Identifiers: *Water pollution economics.

The report consists primarily of a comprehensive reassessment of the nation's municipal sewage treatment needs and costs. Each reported need associated with those systems was evaluated individually on the basis of the kind and normal size of the project required to eliminate it and the average unit cost of components required. In addition, adjustments were made to reflect the higher than average costs that occur in some States. Expected future needs and unreported needs were also evaluated in terms of observed statistical relationships between capital supply and growth and replacement factors. The report also deals with industrial investment requirements, historical investments, Federal cost-sharing, priority systems, public treatment of industrial wastes, and status of regional waste handling systems.

PB-215 848
Environmental Protection Agency, Washington, D.C. Office of Water Programs.
SEWAGE FACILITIES CONSTRUCTION, 1970.

1973, 58p

Descriptors: (*Sewage treatment, *Contracts), Grants.
Identifiers: *Sewage treatment plants.

The publication is one of an annual series compiled and published under the authority contained in Section 5 (c) of the Federal Water Pollution Control Act. The data presented reflect the types and costs of sewage treatment facilities and collecting sewers for which contracts were awarded during the calendar year 1970.

PB-215 849
Federal Water Pollution Control Administration, Washington, D.C.
SEWAGE AND WATER WORKS CONSTRUCTION, 1967.

1967, 17p

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts).
Identifiers: *Sewage treatment plants.

The annual report of 'Sewage and Water Works Construction 1967' is published to provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the

necessary physical facilities. This publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved.

PB-215 850
Federal Water Pollution Control Administration, Washington, D.C.
SEWAGE AND WATER WORKS CONSTRUCTION, 1965.

1973, 17p

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), Grants.

The annual report of 'Sewage and Water Works Construction 1965' is published as one part of the basic data program required and authorized in Public Law 660 (as amended by Public Law 87-88), the Federal Water Pollution Control Act. The data published herein provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities.

PB-215 851
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
RECOMMENDED STATE LEGISLATION AND REGULATIONS. URBAN WATER SUPPLY AND SEWERAGE SYSTEMS ACT AND REGULATIONS. WATER WELL CONSTRUCTION AND PUMP INSTALLATION ACT AND REGULATIONS. INDIVIDUAL SEWAGE DISPOSAL SYSTEMS ACT AND REGULATIONS.
Jul 65, 113p PHS-Pub-1451

Descriptors: (*Septic tanks, *Regulations), (*Water wells, *Regulations), (*Government policies, Septic tanks), State government, Legislation.

One of the growing public health problems today is achieving satisfactory water supply and sewerage services in urban areas and in urban-like developments in nonurban areas. Widespread and uncontrolled use of individual wells and septic tanks in and near urban areas can endanger the public health because of associated hazardous chemical and bacteriological contamination. A report is made on recommendations for legislation endowing state and local agencies with regulatory authority over individual wells and septic tank installations.

PB-215 852
Communicable Disease Center, Atlanta, Ga.
TRAINING MANUAL. SWIMMING POOLS. DISEASE CONTROL THROUGH PROPER DESIGN AND OPERATION.
Environmental Sanitation series,
Jerrold M. Michael. 1959, 152p PHSPub-665

Descriptors: (*Swimming pools, Maintenance), (*Public health, Swimming pools), Handbooks, Disinfection.

Contents:
- Swimming pool sanitation;
- Constructing and remodeling a public swimming pool and bathhouse;
- Sample calculations for maximum swimmer load;
- Sanitary and public health items relating to swimming pools;
- Operation and maintenance of a public swimming pool and bathhouse;
- Testing swimming pool water for chlorine residual and pH;
- Inspection of pool installation and bacteriological sampling of public swimming pool waters;
- Operation check list for swimming pools.

PB-215 853
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
A STUDY OF INDUSTRIAL WASTE POLLUTION IN THE SOUTH PLATTE RIVER BASIN. APPENDIX C. OUTFALL STUDY, LOCATION AND SAMPLING RESULTS.
Dec 66, 83p PR-6C
Supplement to the Basic Report.

Descriptors: (*Platte River Basin, *Outfall sewers).

A two and one-half year Industrial Waste Survey in the South Platte River Basin was culminated by the Federal Water Pollution Control Administration, South Platte River Basin Project in late 1966. The highlights of this Survey together with major recommendations on pollution abatement by industry are given in the basic report entitled 'A Study of Industrial Waste Pollution in the South Platte River Basin.' The Appendixes given here represent a supplementary issue to the main report. The appendix provides the location and description of 639 outfalls, pipes and ditches believed to represent potential or real sources of contributory pollution to Basin streams. These outfalls receive industrial wastes from one or more industries which could not be readily identified. Waste sampling was undertaken on 74 of these outfalls and all results are shown.

PB-215 854
Federal Water Quality Administration, Washington, D.C.
BULLETIN OF COURSES. WATER POLLUTION CONTROL TRAINING PROGRAM, JULY 1970 TO DECEMBER 1971.
1971, 49p

Descriptors: (*Water pollution, Education).
Identifiers: *Water pollution control.

The report contains the courses offered from July 1970 to Dec. 1971 in water pollution control by the U.S. Department of the Interior at five locations in the United States. These locations are the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio; the Robert S. Kerr Water Research in Ada, Oklahoma; the Southeast Water Laboratory in Athens, Georgia; the Pacific Northwest Water Laboratory in Corvallis, Oregon; and the Hudson-Delaware Basins Office in Edison, New Jersey. The objective of the Training Program is to provide specialized training in the causes, prevention, and control of water pollution.

PB-215 855
West Virginia Univ., Morgantown.
COMPARISON OF KINETIC AND DIFFUSIONAL MODELS FOR SOLID-LIQUID REACTIONS,
C. Y. Wen. 1967, 27p
Grant FWPCA-WP-00699
Report on Mass Transfer and Chemical Reaction in Water Pollution.

Descriptors: (*Particles, *Diffusion), (*Chemical reactions, Particles).

A comparison of the kinetic and diffusional models for solid-liquid reactions occuring in a spherical particle is presented. The similarities and differences of the unreacted-core shrinking model and the homogeneous model are examined in light of the rate-controlling factors. In view of the similarity of the two models, it is shown that erroneous conclusions in regard to the mechanism and the activation energies may be drawn from an analysis of the experimental data. A more versatile model is developed in order to augment the two models so that wider varieties of solid-liquid reaction systems may be treated. The concept of effectiveness factors in solid-liquid reactions is introduced and the influence of diffusion is ascertained. The present study presents a better phenomenological understanding of the mechanism of mass transfer and chemical reaction occuring in water pollution between liquid and solid. (Author)

PB-215 856
National Center for Urban and Industrial Health, Chevy Chase, Md. Environmental Sanitation Program.
PROCEDURES MANUAL. DETROIT RIVER--LAKE ERIE PROJECT LABORATORY SECTION.
1964, 47p
See also PB-217 760.

Descriptors: (*Detroit River, *Water pollution), (*Lake Erie, Water pollution).
Identifiers: *Water quality river.

The report describes laboratory techniques used to analyse water samples taken from Lake Erie and Detroit river areas and presents statistical data obtained from the sampling.

PB-215 857
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
CHEMICAL ASPECTS OF COAGULATION,
Werner Stumm, and J. J. Morgan. Aug 62, 24p
Grants PHS-WP-13, PHS-WP-98
Pub. in Jnl. of the American Water Works Association, v54 n8 p971-994 Aug 62, Reprint No. 41.

Descriptors: (*Sewage treatment, *Coagulation), (*Flocculating, Sewage treatment), Colloid chemistry, Coagulants, Iron, Aluminum.

The report describes the chemical processes of coagulation and flocculation used in the removal of colloidal and dissolved substances from water.

PB-215 858
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
MANUAL OF INDIVIDUAL WATER SUPPLY SYSTEMS.
1962, 132p PHS-Pub-24-Rev-62
Prepared in cooperation with the Joint Committee on Rural Sanitation, Washington, D.C. Revision of report dated 1950, PB-215 955.

Descriptors: (*Water supply, Handbooks), Public health, Water treatment, Sources.

An essential requirement for healthful and comfortable living is a dependable supply of water for drinking and other domestic uses. This supply should be palatable, convenient, of good quality, and adequate in quantity. This manual is a revision of PHS Publication No. 24, Individual Water Supply Systems, issued in 1950. It is hoped that the manual will be useful to State and local health authorities, well-drillers, industry groups, and others concerned with the development and operation of such supplies. This manual emphasizes the sanitation aspects of small supply systems such as those serving individual dwellings, farms, rural schools or similar institutions, recreational or tourist accommodations, camps, or other installations not having access to public water supply systems. The recommended practices should be helpful in the design, construction, and operation of these types of private and quasi-public systems.

PB-215 859
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
WATER QUALITY CONTROL STUDY NORTHEAST CAPE FEAR RIVER BASIN NORTH CAROLINA.
Feb 67, 73p

Descriptors: (*Cape Fear River Basin, *Water pollution), (*North Carolina, Water pollution), (*Reservoirs, Cape Fear River Basin).

A study of the need for and value of streamflow regulation for water quality control, for present and future conditions, has been made for the Northeast Cape Fear River Basin, North Carolina. The future needs were based on the results of economic and demographic studies of the area. It was concluded that water quality control measures beyond secondary waste treatment were necessary to protect the beneficial water users in the basin. Storage in the proposed reservoirs would satisfy a portion of the water quality control needs of the basin. (Author)

PB-215 860
Public Health Service, Washington, D.C.
PUBLIC HEALTH SERVICE DRINKING WATER STANDARDS.
1962, 70p PHS-Pub-956

Descriptors: (*Water supply, Standards), (*Public health, Standards), (*Potable water, *Standards).

Contents: Source and protection; Bacteriological quality; Physical characteristics; Chemical characteristics; Radioactivity; Recommended analytical methods; and Barium.

PB-215 861
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
OCEANOGRAPHIC AND RELATED WATER QUALITY STUDIES IN SOUTHEASTERN ALASKA, AUGUST 1965.
Jul 66, 132p

Descriptors: Water pollution, Alaska.

Upon request of the Alaska Department of Health and Welfare, related oceanographic and water quality studies were conducted at four locations in Southeastern Alaska. The studies, preliminary in nature, were conducted in: Gastineau Channel, adjacent to the cities of Juneau and Douglas; Fritz Cove-Auke Bay, near Juneau; Silver Bay, near Sitka; and Ward Cove, near Ketchikan (see Frontispience). The urgent need for a sewage and sewage treatment system to serve the cities of Juneau and Douglas, Alaska, and surrounding Borough necessitated the request for an oceanographic and related water quality survey of Gastineau Channel. (Author)

PB-215 862
New York State Dept. of Health, Albany.
USE OF MATHEMATICAL MODELS AS AIDS TO DECISION MAKING IN WATER QUALITY CONTROL,
Charles R. Hall, and Leo J. Hetling. 1968, 41p
Presented at the National Meeting of the American Inst. of Chemical Engineers (63rd), St. Louis, Mo. February 19, 1968. Prepared in cooperation with Water Resources Engineer, Maryland Dept. of Water Resources, Annapolis, Md.

Descriptors: (*Water resources, Hydraulic models), (*Water pollution, Cost analysis), (*Water quality, *Cost analysis), (*James River Basin, Water pollution), Virginia, Decision making, Benefit cost analysis.

A method of utilizing existing water quality and hydraulic computer models to arrive at least cost solutions of water quality problems is presented. The alternatives considered are reduction of waste loads by treatment, industrial process modification, and construction of reservoirs for low flow augmentation. The application of the methods to water resources problems in the James River Basin is discussed. The least cost solution of the water quality control problem is presented along with a subjective analysis of various alternatives. (Author)

PB-215 863
Federal Water Pollution Control Administration, Washington, D.C.
POLLUTION-CAUSED FISH KILLS IN 1965.
Annual rept. 6th.
1965, 34P WP-12

Descriptors: (*Water pollution, *Fishes).
Identifiers: *Fishkill, *Water pollution effects (Animals).

The report discusses pollution-caused fish kills reflected in the investigation of 531 separate kills documented by State officials in 1965. Forty-four States reported that 11 3/4 million fish were lost because of pollution.

PB-215 864
Public Health Service, Chicago, Ill. Upper Mississippi and Great Lakes Drainage Basins Office.
UPPER PORTION UPPER MISSISSIPPI RIVER DRAINAGE BASIN. A COOPERATIVE STATE--FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.

1953, 90P PHS-WPS-57 PHS-Pub-321
Prepared in cooperation with Minnesota State Dept. of Health.

Descriptors: (*Mississippi River Basin, *Water pollution), (*Minnesota, Water pollution).

The report is based on data available as of January 1, 1953, on sources of pollution and treatment facilities employed, and on stream conditions revealed by field surveys made by the Minnesota Department of Health over a period extending from 1939 through 1952. The report also presents information concerning use of water resources, pollution entering water resources and resulting damages, and benefits which may result from pollution prevention and abatement. The report has been limited to known sources of pollution and their effects upon adjacent streams. (Author Modified Abstract)

PB-215 865
National Center for Urban and Industrial Health, Cincinnati, Ohio.
ENVIRONMENTAL HEALTH PLANNING GUIDE.
Sep 67, 105p PHS-Pub-823-Rev-67

Descriptors: (*Public health, *Urban planning), (*Regional planning, Public health), Handbooks.

The guide is designed to assist in the preparation of the environmental health plan as a part of the comprehensive health plan (physical, mental and environmental) prepared by each State and urban area. Its use will identify to the community and the State those factors which contribute to a healthful environment, the steps needed to achieve and maintain a positively healthful environment, now and in the future, and the resources and timing required to carry out the necessary steps. (Author)

PB-215 867
Environmental Control Administration. Cincinnati, Ohio.
SUMMARIES OF SOLID WASTES DEMONSTRATION: GRANT PROJECTS - 1968.
Rept. for 1 Jun 66-31 Dec 67,
Charles E. Sponagle. 1968, 102p PHS-Pub-1821

Descriptors: (*Waste disposal, *Grants), Research.
Identifiers: *Solid waste disposal.

The principal features of projects which received demonstration grant support from the Solid Wastes Program prior to January 1, 1968, are summarized. Each project is identified by title, type, and grant number. The grantee, project director, cost and duration of the project is shown. Project objectives, procedures, and a brief statement of progress then follow to complete each summary.

PB-215 868
Federal Water Pollution Control Administration, Washington, D.C.
SEWAGE AND WATER WORKS CONSTRUCTION, 1968.

1968, 16p WP15-68

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, Contracts).
Identifiers: Sewage treatment plants.

This annual report of 'Sewage and Water Works Construction 1968' is published to provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. This publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved.

PB-215 870
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
SEWAGE AND WATER WORKS CONSTRUCTION.
Annual rept.,
Kenneth H. Jenkins, and Florence G. Simmons.
1964, 17p PHS-Pub-758-Rev-64

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, Contracts).
Identifiers: *Sewage treatment plants.

The report is published as one part of the basic data program to provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. The publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved.

PB-215 871
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
AN INDUSTRIAL WASTE GUIDE TO THE FRUIT PROCESSING INDUSTRY.

1962, 21p PHS-Pub-952

Descriptors: (*Food processing, *Industrial waste treatment), (*Canneries, Industrial waste treatment).
Identifiers: *Fruit processing, *Water pollution control.

The report is intended primarily to provide management and operating personnel in the canning industry a better understanding of the overall problems involved in handling fruit canning waste, and to acquaint them with implant practices which reduce waste volume and strength. Available methods of waste treatment, pollution prevention and nuisance abatement are discussed. This guide is also intended to acquaint sanitary engineers and regulatory personnel with the sources and nature of fruit canning wastes and with the progress that has been made in treatment of such wastes. (Author)

PB-215 872
National Inst. of Allergy and Infectious Diseases, Hamilton, Mont. Rocky Mountain Lab.
TOXOPLASMOSIS. PATHOLOGY OF NEONATAL DISEASE PATHOGENESIS, DIAGNOSIS, AND TREATMENT,
Jacob Karl Frenkel, and Saul Friedlander. 1951, 167p PHS-Pub-141

Descriptors: (*Toxoplasmosis, *Infants), Pathology, Diagnosis, Therapy, Infectious diseases,

Parasitic diseases, Signs and symptoms, Clinical medicine, Toxoplasma, Protozoa.

The paper describes the lesions found in patients with neonatal toxoplasmosis and stresses the dynamic relationship between the human host and the microorganism. Various clinical syndromes are integrated in terms of pathogenesis and certain suggestions regarding the diagnosis and treatment of toxoplasmosis are discussed.

PB-215 873
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. VOLUME I. REGION I - CONNECTICUT, MAINE, MASSACHUSETTS, NEW HAMPSHIRE, RHODE ISLAND, VERMONT.
1958, 78p
See also report dated 1958, PB-215 877.

Descriptors: (*Water supply, *Connecticut), (*Water supply, *Maine), (*Water supply, *Massachusetts), (*Water supply, *New Hampshire), (*Water supply, *Rhode Island), (*Water supply, *Vermont), (*Water treatment, Inventories).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities in the six states serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. At the end of each State listing there appear the names of all places having a 1950 population of 100 or more but which were not reported as having a community water supply. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-215 874
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. VOLUME 9. REGION IX - ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON.
1958, 125p

Descriptors: (*Water supply, *Alaska), (*Arizona, *Water supply), (*California, *Water supply), (*Hawaii, Water supply), (*Nevada, *Water supply), (*Oregon, *Water supply), (*Washington (State), *Water supply), (*Water treatment, Inventories).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities in the five states serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. At the end of each State listing there appear the names of all places having a 1950 population of 100 or more but which were not reported as having a community water supply. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-215 875
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
HANDBOOK ON SANITATION OF VESSEL CONSTRUCTION.
1965, 95p PHS-Pub-393

Descriptors: (*Tanks (Containers), Design), (*Storage tanks, Design), (*Swimming pools, Design), (*Public health, Tanks (Containers)), Food sanitation, Rats.

Set forth in this handbook are minimum public-health standards relating to general sanitation and ratproofing in the construction of vessels. These standards have been developed over a period of several decades; experience has shown that their observance during construction, reconstruction, or major repair, will make it much easier to maintain the vessels in an acceptable, sanitary condition during operation. (Author)

PB-215 876
Public Health Service, Washington, D.C. Bureau of State Services.
SEWAGE AND WATER WORKS CONSTRUCTION - 1958,
Richard S. Green, William H. Abbott, and Elsie M. Gibson. 1959, 18p PHS-Pub-673

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), Tables (Data).
Identifiers: *Sewage treatment plants.

The contract award data presented in this publication for the year 1958 result from the careful examination of over 25,000 contract notifications in the sewage and water works construction and related fields. All notifications of similar contracts awarded in the same geographical area are checked to reduce the chance of duplication. Certain contracts, primarily those covering sewage treatment plants, are checked and verified by the various state water pollution control agencies.

PB-215 877
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. VOLUME 2. REGION II - DELAWARE, NEW JERSEY, NEW YORK, PENNSYLVANIA.

1958, 146p
See also report dated 1958, PB-215 873.

Descriptors: (*Water supply, *Delaware), (*Water supply, *New Jersey), (*Water supply, *New York), (*Water supply, *Pennsylvania), (*Water treatment, Inventories).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities in the four states serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. At the end of each State listing there appear the names of all places having a 1950 population of 100 or more but which were not reported as having a community water supply. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-215 878
National Center for Urban and Industrial Health, Cincinnati, Ohio.
PROCEEDINGS: THE SURGEON GENERAL'S CONFERENCE ON SOLID WASTE MANAGEMENT FOR METROPOLITAN WASHINGTON. 19-20 JULY 1967.
Leo Weaver. 1967, 191p
Library of Congress Catalog Card no. 67-62888.

Descriptors: (*Waste disposal, *District of Columbia), (*Waste disposal, *Maryland), (*Waste disposal, *Virginia), Meetings, Regional planning.
Identifiers: *Solid waste disposal, *Washington Metropolitan Area.

Contents: Health aspects of solid waste disposal, Politics and trash, Present practices and needs in the metropolitan area, Air pollution and solid waste disposal, Solid waste handling by federal installations, Abandoned and scrap automobiles, Legislative needs for a metropolitan solid waste disposal program, Technology today, Land reclamation, Refuse reduction processes, Recycling and utilization, and Development of a regional solid waste disposal plan.

PB-215 879
Federal Water Pollution Control Administration, Washington, D.C. Div. of Grants Management.
WATER POLLUTION CONTROL RESEARCH AND TRAINING GRANTS. 1967 GRANT AWARDS: RESEARCH GRANTS, DEMONSTRATION GRANTS, TRAINING GRANTS, AND RESEARCH FELLOWSHIPS.

1967, 79p CWA-10

Descriptors: (*Water pollution, *Grants), Research, Education.

The report lists 1967 grants for research, demonstration, and training authorized under section 5 of the Federal Water Pollution Control Act, Public Law 660, as amended.

PB-215 880
Public Health Service, Chicago, Ill. Upper Mississippi and Great Lakes Drainage Basin Office.
WESTERN GREAT LAKES DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
1951, 67P PHS-WPS-14 PHS-Pub-143
Prepared in cooperation with Illinois Sanitary Water Board, Indiana Stream Pollution Control Board, Michigan Water Resources Commission, Minnesota Dept. of Health, and Wisconsin Committee on Water Pollution.

Descriptors: (*Great Lakes Region, *Water pollution), (*United States, *Water resources).

The report presents information relative to the Western Great Lakes basin and describes water resource usage, water pollution and resulting damage, and pollution prevention measures in effect and those required.

PB-215 881
Federal Water Pollution Control Administration, Washington, D.C.
SEWAGE AND WATER WORKS CONSTRUCTION.
1966, 16p

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts).
Identifiers: *Sewage treatment plants.

This annual report of 'Sewage and Water Works Construction 1966' is published to provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. This publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved.

PB-215 882/2
Henningson, Durham and Richardson, Inc., Omaha, Nebr.
OMAHA-COUNCIL BLUFFS SOLID WASTE MANAGEMENT PLAN.
Status rept.

1969, 247P EPA-SW-3tsg, PHS-Pub-2117
Grant PHS-UI-00041
Library of Congress Catalog Card no. 71-608770.
Paper copy available from GPO $2.25 as stock no. 5502-0012.

Descriptors: (*Regional planning, *Waste disposal), (*Nebraska, Waste disposal), (*Iowa, Waste disposal), Management planning, Earth

fills, Government polices, Refuse disposal, Surveys, Systems analysis, Cost estimates, Garbage, Local government, Recommendations.
Identifiers: *Solid waste disposal, Sanitary landfills, Douglas County (Nebraska), Sarpy County (Nebraska), Pottawattamie County (Iowa), Omaha (Nebraska), Council Bluffs (Iowa).

The report presents and analyzes pertinent solid waste data, identifies problems indicated by the data, sets objectives that if achieved would solve identified problems, and finally, proposes immediate, intermediate, and long-range measures for achieving objectives. The plan should provide an invaluable management tool with which to begin solving the solid waste problems in the Omaha-Council Bluffs metropolitan area.

PB-215 883
Public Health Service, Washington, Div. of Sanitation.
THE SANITARY LANDFILL METHOD OF REFUSE DISPOSAL IN NORTHERN STATES,
Leo Weaver, and Donald M. Keagy. 1952, 37p PHS-Pub-226

Descriptors: (*Waste disposal, *Earth fills).
Identifiers: *Solid waste disposal, *Sanitary landfills.

The report covers a joint experimental operation of the North Dakota State Health Department, the city of Mandan, North Dakota and the public health service. Because use of a sanitary land-fill can cause problems created by freezing in colder climates, this experiment was made to test the success of the operation. Included in the report is design, site, observations, costs, depth of cover, regulations, and weather related factors.

PB-215 900
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
EFFECTS OF POLLUTION ON AQUATIC LIFE RESOURCES OF THE SOUTH PLATTE RIVER BASIN IN COLORADO.

Dec 67, 167p PR-11

Descriptors: (*Platte River Basin, *Water pollution), (*Colorado, Water pollution), (*Biological surveys, Platte River Basin).
Identifiers: *Water pollution effects (Plants), *Water pollution effects (Animals).

The report contains the results of biological studies undertaken in the South Platte River Basin during the period of July 1963 through January 1967. (Author)

PB-215 901
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
GROUND-WATER POLLUTION IN THE MIDDLE AND LOWER SOUTH PLATTE RIVER BASIN OF COLORADO.

Jul 67, 126p PR-9

Descriptors: (*Platte River Basin, *Water pollution), (*Ground water, Platte River Basin), (*Colorado, Water pollution), Water wells.

On July 18, 1963, the Governor of Colorado requested the Secretary of Health, Education, and Welfare to assist the State in determining sources of pollution and quality of waters of the South Platte River Basin within the State of Colorado. Findings and recommendations from this study were to lead to a program of pollution abatement to be developed jointly by the South Platte River Basin Project and the Colorado State Department of Public Health. Specific water quality objectives were recommended for the South Platte River and its major tributaries. (Author)

PB-215 902
American Public Works Association, Chicago, Ill. Research Foundation.
COMBINED SEWER REGULATOR OVERFLOW FACILITIES.
Water pollution control research series.
25 Jun 70, 152p FWQA11022-DMU-07/70
Contract DI-14-12-456
Paper copy available from GPO $1.50 as I67.13/4:11022DMU07/0.

Descriptors: (*Combined sewers, *Flow regulators), (*Overflows, Flow regulators).
Identifiers: *Water pollution control.

Current design, operation and maintenance practices used by local jurisdictions in the United States and Canada were determined by personal interviews and compiled in the report. Particular attention was given to the performance of various types of regulators, the use of tide gates, new designs, European practices and the systems concept of combined sewer regulation. Thirty-seven drawings and photographs of regulators are included. Seventeen recommendations are made, the adoption of which would upgrade regulator facilities and tend to reduce receiving water pollution from combined sewer overflows. (Author)

PB-215 903
Kentucky Dept. of Health, Frankfort.
KENTUCKY SOLID WASTE MANAGEMENT PLAN - STATUS REPORT, 1970.

1971, 171p EPASW-6TSG
Grant PHS-EC-00005
See also Appendix A, PB-201 205.
Paper copy available from GPO $1.50 as EP3.2:K41/970, Stock no. 5502-0024.

Descriptors: (*Waste disposal, *Kentucky), Regional planning.
Identifiers: *Solid waste disposal.

The report looks at Kentucky's solid waste efforts. The first section discusses the environment while the next briefly summarize the physical, social and economic conditions and solid waste management practices. Next the major problem areas and recommended courses of action essential to improved solid waste management practices and their effective regulation are outlined. The required inter-agency and inter-governmental coordination are also presented.

PB-215 904
Drexel Inst. of Tech., Philadelphia, Pa.
SANITARY LANDFILL. A BIBLIOGRAPHY,
R. L. Steiner, and Renee Kantz. 1968, 38p BSWM-SW-4, PHS-Pub-1819
Grant PHS-UI-00516

Descriptors: (*Earth fills, *Bibliographies).
Identifiers: *Solid waste disposal, *Sanitary landfills.

A bibliography on sanitary landfills is presented for the period 1925 - 1968, covering such materials as garbage and refuse disposal, ground water contamination, loading and structural properties, urban and rural sites, landfill internal mechanics, collecting methodology, types and classifications, problems, solid wastes, weather considerations, and design.

PB-215 905
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
PUBLIC SEWAGE TREATMENT PLANT CONSTRUCTION, 1955.

1956, 16p PHS-Pub-488

Descriptors: (*Sewage treatment, *Contracts), Tables (Data).
Identifiers: *Sewage treatment plants.

The report presents statistical data for the construction of sewage treatment plants and other sewerage projects as determined from construction contracts awarded during the year 1955 by the Nation's municipalities. Although the number and cost of the contract awards does not represent actual construction put-in-place, it does provide a comparison from year to year of progress made in providing treatment facilities necessary to lower the backlog of needed construction, to replace obsolete facilities, and to satisfy the requirements of increasing urban population. (Author)

PB-215 906
Public Health Service, Washington, D.C. Div of Air Pollution.
THE FEDERAL AIR POLLUTION PROGRAM.

Dec 66, 54p PHS-Pub-1560

Descriptors: (*Air pollution, *Government policies), National government.

The booklet, prepared for initial distribution at the 1966 National Conference on Air Pollution, is a portrait of the Federal air pollution program as it looked in December 1966.

PB-215 907
Bureau of Solid Waste Management, Rockville, Md.
AN ACCOUNTING SYSTEM FOR SANITARY LANDFILL OPERATIONS,
Eric R. Zausner. 1969, 21p BSWM-SW-15ts PHS-Pub-2007
Library of Congress catalog card no. 70-604125.

Descriptors: (*Waste disposal, *Accounting).
Identifiers: *Solid waste disposal, *Sanitary landfills.

The increasing costs and complexities of solid waste handling require new, more sophisticated management techniques. Data on performance and the costs of operation and ownership are essential for the use of these management tools. Hence, an adequate information system is a prerequisite to effective management. Although cost accounting represents only one part of the total information system, its design, installation, and utilization can represent the most significant step in the development of effective solid waste management. The proposed system provides a guide to the type and quantity of information to be collected, its classification, and the method of collection. It is intended to be of use to municipal or private personnel involved in landfill operation and ownership.

PB-215 908
National Center for Urban and Industrial Health, Cincinnati, Ohio.
THE MOTORCYCLE IN THE UNITED STATES.

Dec 67, 14p PHS-Pub-999-UIH-7
Paper copy available from GPO $0.10 as FS2.300:UIH-7.

Descriptors: (*Motorcycles, *United States), Motor vehicle accidents, Safety, Inventories.

The report briefly looks at the growth rate of motorcycles in the United States, deaths and injuries from motorcycle accidents, and safety procedures.

PB-215 910
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
COOPERATIVE PROGRAM FOR THE CERTIFICATION OF INTERSTATE SHELLFISH SHIPPERS. PART I. SANITATION OF SHELLFISH GROWING AREAS,
Eugene T. Jensen. 1962, 38p PHS-Pub-33-Pt-1-Rev-62

Descriptors: (*Shellfish, *Food sanitation), (*Water pollution, Shellfish).

Since the growing and processing of shellfish are two distinct phases of operation in the shellfish industry, the manual has been prepared in two parts: Part I of the manual, is intended as a guide for the preparation of State shellfish sanitation laws and regulations, and for sanitary control of the growing, relaying, and purification of shellfish.

PB-215 911
Federal Water Pollution Control Administration, Washington, D.C. Office of Public Information.
A PRIMER ON WASTE WATER TREATMENT.
Oct 69, 27p CWA-12
Paper copy available from GPO $0.55 as CWA-12.

Descriptors: (*Industrial waste treatment, Reviews), (*Sewage treatment, Reviews).
Identifiers: *Water pollution control.

The report describes briefly methods now used and processes being developed for the treatment of municipal and industrial wastes. It also gives general categories of pollutants and explains them. A glossary of terms is included.

PB-215 912
Public Health Service, Washington, D.C. Bureau of Disease Prevention and Environmental Control.
HEALTH PROTECTION; THE TARGET OF THE BUREAU OF DISEASE PREVENTION AND ENVIRONMENTAL CONTROL.

Oct 67, 36p PHS-Pub-1634-Rev.

Descriptors: (*Public health, National government).
Identifiers: *Government agencies, *Bureau of Disease Prevention and Environmental Control.

The report is a revision of PB-215 928 and discusses the activities of the following: Bureau of Disease Prevention and Environmental Control; National Center for Air Pollution Control; National Center for Chronic Disease Control; National Communicable Disease Center; National Center for Radiological Health; National Center for Urban and Industrial Health.

PB-215 913
Communicable Disease Center, Atlanta, Ga.
MITES OF PUBLIC HEALTH IMPORTANCE AND THEIR CONTROL. TRAINING GUIDE - INSECT CONTROL SERIES,
Harry D. Pratt. May 63, 33p PHS-Pub-772-ICS-9

Descriptors: (*Insect control, *Mites), (*Public health, Insect control).

Contents: Public health importance of mites; Mite characteristics and systematic position; Some important mite species; and Control of mites and mite-borne diseases.

PB-215 914
Federal Water Pollution Control Administration, Washington, D.C. Office of Public Information.
SHOWDOWN---FOR WATER.
1968, 27p CWA-11
Paper copy available from GPO $0.65 as I67.2:C82/2.

Descriptors: (*Water pollution, Reviews).

The report gives a brief popularized account of federal programs, policies, and research directed toward solving the problem of water pollution.

PB-215 915
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
INVENTORY OF INTERSTATE CARRIER WATER SUPPLIES, BY STATES AND PUBLIC HEALTH REGIONS. JULY 1963.
1964, 30p PHS-Pub-1116

Descriptors: (*Water supply, Inventories).

The interstate carrier water supplies listed herein, which currently number 766, serve some 2,000,000 persons who travel daily from State to State on airplanes, buses, railway cars, and vessels. In addition, they are the source of water for 76,000,000 persons residing in the communities from which water is taken and placed aboard the conveyances. Thus, about 57% of the total United States population provided with public water supply, utilize systems which are certified by the Surgeon General as meeting the Public Health Service Drinking Water Standards. The last inventory of interstate carrier water supplies was issued in 1960. Since that time the status of some supplies has changed and other supplies have been added or deleted. The inventory is published for use of State Health Department engineers, municipal authorities and Public Health Service personnel who are concerned with the annual certification of the supplies and discussions which arise therefrom. Supplies are listed with regard to approval. (Author)

PB-215 916
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
INVENTORY OF INTERSTATE CARRIER WATER SUPPLIES BY STATES AND PUBLIC HEALTH SERVICE REGIONS.
Aug 66, 41p

Descriptors: (*Water supply, Inventories).

This Inventory lists the 775 water supplies serving interstate carriers which have been classified as Approved, Provisionally Approved, or No Current Report on the data of recall from the computer, August 9, 1966. Water supplies listed as 'Approved' are in substantial compliance with the 1962 Public Health Service Drinking Water Standards. Those which are 'Provisionally Approved' are classified as such, pending the correction of certain defects. Water supplies which are classified as 'No Current Report' have been found acceptable at the time of the last survey report, but have been listed as 'No Current Report' automatically because the bacteriological records have not been kept up-to-date. (Author)

PB-215 917
Federal Water Pollution Control Administration, Washington, D.C.
TRANSCRIPT OF PROCEEDINGS: PROGRESS EVALUATION MEETING IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE RED RIVER OF THE NORTH AND ITS TRIBUTARIES NORTH DAKOTA-MINNESOTA. HELD AT FARGO, NORTH DAKOTA ON 6 DECEMBER 1967.
1968, 187p
Library of Congress catalog card no. 68-62123.

Descriptors: (*Red River of the North, *Water pollution), (*Minnesota, Water pollution), (*North Dakota, Water pollution).

The purpose of the report is to evaluate progress toward pollution control in the waters covered by the Conference in the matter of pollution of the interstate waters of the Red River of the North and its tributaries.

PB-215 919
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
POLLUTION-CAUSED FISH KILLS IN 1961.
1961, 23p PHS-Pub-847-61
See also PB-215 918.

Descriptors: (*Water pollution, Fishes).

Identifiers: *Fishkill, *Water pollution effects (Animals).

This is the second annual summary report of pollution-caused fish kills published by the Public Health Service. The present report and summary includes all reported fish kills for the year 1961, along with statistical tabulations and some interpretative remarks.

PB-215 921
Public Health Service, Cincinnati, Ohio.
OHIO RIVER POLLUTION SURVEY. VOLUME I. INTRODUCTORY AND GENERAL SECTIONS MAIN OHIO RIVER MINOR TRIBUTARY BASINS.
Final rept.

1942, 128P

Descriptors: (*Ohio River Basin, *Water pollution).

The report presents information pertaining to sources, amounts and effects on various water uses of polluting material discharged into the watercourses of the 204,000 square miles of the Ohio River Basin and includes cost estimates for comprehensive pollution control measures. (Author)

PB-215 922
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
SULTAN DAM PROJECT, SNOHOMISH RIVER BASIN, WASHINGTON.
Water supply and water quality control study.
Aug 67, 48p

Descriptors: (*Skykomish River Watershed, *Reservoirs), (*Washington (State), *Water resources).

An investigation has been made which disclosed a need for storage in Skykomish River watershed to meet future water demands in the Everett urban area. A need for storage for water quality control is not foreseen at this time. Future water requirements and quality projections are based on economic, demographic, and engineering studies. (Author)

PB-215 923
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WILLAMETTE RIVER BASIN WATER QUALITY CONTROL AND MANAGEMENT,
James M. Quigley. Jan 67, 94p
See also PB-215 925.

Descriptors: (*Willamette River Basin, *Water pollution), (*Oregon, Water pollution).
Identifiers: *Water pollution abatement.

The report is the result of a study of the water quality of the Willamette River system, the uses of the river system, the factors that affect water quality, the probable nature of the economic development of the watershed and its impact on water quality, and the nature of measures that must be taken both to abate pollution in the river system and to prevent recurrence of pollution. It is focused on the presentation of the findings of the study as they relate to requirements for action to control pollution.

PB-215 924
Public Health Service, Washington, D.C.
SECURING HEALTH IN OUR URBAN FUTURE.

3 Dec 65, 13p PHS-Pub-1581

Descriptors: (*Public health, *Urban areas).

Public health leadership has a clear and continuing responsibility to mobilize effective action for

health across the entire range of human activity. Recognizing this broader mission and the critical importance of urbanization in relation to it, my predecessor, Surgeon General Luther L. Terry, sought the advice of a group of outstanding individuals with wide and varied experience as elected officials, scientists, health administrators and practitioners, and private citizens. This Advisory Committee on Urban Health Affairs presented its report to me in December 1965. The paper presents the findings of that committee.

PB-215 925
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
SUMMARY OF WATER QUALITY CONTROL AND MANAGEMENT, WILLAMETTE RIVER BASIN,
James M. Quigley. Jan 67, 15p
See also PB-215 923.

Descriptors: (*Willamette River Basin, *Water pollution), (*Oregon, Water pollution).
Identifiers: *Water pollution abatement.

The report gives a brief review of the water quality problems, difficulties, costs and control of pollution in the Willamette River Basin.

PB-215 926
Public Health Service, Washington, D.C.
HEALTH OF FERROUS FOUNDRYMEN IN ILLINOIS.
1950, 132p PHS-Pub-31
Prepared in cooperation with Illinois Department of Public Health.

Descriptors: (*Occupational diseases, Silicosis), (*Foundries, *Silicosis), (*Industrial medicine, Silicon dioxide), (*Air pollution, *Silicon dioxide), (*Illinois, Occupational diseases), Dusts, Iron, Industrial hygiene, Respiratory diseases, Pulmonary fibrosis, Tuberculosis, Skin diseases, Public health.
Identifiers: *Infoor air pollution, *Air pollution effects (Animals).

The report presents the clinical and environmental findings of a cooperative investigation into the exposures of ferrous foundry workers to silicosis and other hazards. Environmental investigations were made in 18 ferrous foundries, in which approximately 1,100 samples of air-borne dust were collected and studied. The amount of free silica in the air-borne dust varied with the operation and ranged from 13 percent at coremaking to 29 percent in pouring, shakeout and sand conditioning. The percentage of iron in the air-borne dust was found to range from 3 to 9 percent for all operations except casting cleaning, for which the proportion varied from 30 to 38 percent. Operational dust levels at various foundry activities in general were found to be much lower than those reported in earlier investigations. Concentrations of aldehydes were of a low order of magnitude. Carbon monoxide concentrations were relatively low in most instances. The most significant clinical findings dealt with those of the respiratory system. Pulmonary fibrosis of occupational origin was found in 9.2 percent of the men. Reinfection type of tuberculosis was found in 0.7 percent of white workers and in 1.7 percent of the Negroes. Skin diseases probably of occupational origin, was found in 1.7 percent of the men. The correlation of the clinical and environmental findings reveals that there is no reason to believe that dust conditions in the foundries studied have improved in the past 10 to 20 years.

PB-215 927
Federal Water Pollution Control Administration, Washington, D.C.
CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE COLORADO RIVER AND ITS TRIBUTARIES (6TH) SESSION, DENVER LAW CENTER AUDITORIUM, DENVER, COLORADO, JULY 26, 1967. TRANSCRIPT OF PROCEEDINGS.
26 Jul 67, 217p

Descriptors: (*Colorado River Basin, *Water pollution), Proceedings.

The purpose of the conference was to bring together the State water pollution control agencies, representatives of the United States Department of the Interior, and other interested parties to review the existing situation, the progress which has been made, to lay a basis for future action by all parties concerned, and to give the States, localities, and industries an opportunity to take any indicated remedial action under State and local law.

PB-215 928
Public Health Service, Washington, D.C. Bureau of Disease Prevention and Environmental Control.
HEALTH PROTECTION; THE TARGET OF THE BUREAU OF DISEASE PREVENTION AND ENVIRONMENTAL CONTROL.
1967, 36p PHS-Pub-1634
See also report dated Oct 67, PB-215 912.

Descriptors: (*Public health, National government).
Identifiers: *Government agencies, *Bureau of Disease Prevention and Environmental Control.

Contents:
Bureau of Disease Prevention and Environmental Control;
National Center for Air Pollution Control;
National Center for Chronic Disease Control;
National Communicable Disease Center;
National Center for Radiological Health;
National Center for Urban and Industrial Health.

PB-215 929
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
WATER QUALITY CONTROL STUDY, LITTLE SIOUX RIVER BASIN, IOWA: STUDY OF THE NEEDS AND VALUE OF STORAGE FOR WATER QUALITY CONTROL.
Jun 67, 52p

Descriptors: (*Sioux River Basin, *Reservoirs), (*Iowa, *Water resources), Water pollution.

A survey was made which discloses immediate and future needs for storage for streamflow regulation for the purpose of water quality control. Future needs are based on results of economic and demographic studies projecting population and industrial growth. (Author)

PB-215 930
Public Health Service, Washington, D.C.
A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL FOR THE GREEN BAY WESTERN SHORE DRAINAGE BASIN DEVELOPMENT IN COOPERATION WITH THE STATE WATER POLLUTION CONTROL AGENCIES OF MICHIGAN AND WISCONSIN.
1954, 47p PHS-Pub-368

Descriptors: (*Water pollution, *Green Bay), (*Water pollution, *Lake Michigan), (*Michigan, Water pollution), (*Wisconsin, Water pollution).

The report sets forth a water pollution control program for the Green Bay Western Shore Drainage Basin. This program, which is based on data available as of January 1, 1954, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the waters and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect, as well as those which are needed.

PB-215 931
Public Health Service, Washington, D.C. Bureau of State Services.
PUBLIC HEALTH PROBLEMS IN CIVIL DEFENSE: AN OUTLINE GUIDE COVERING SANITATION ASPECTS OF MASS EVACUATION.
1956, 31p PHS-Pub-498

Descriptors: (*Nuclear warfare defense, *Public health).

The report discusses the civil defense problems which could occur in event of a nuclear war. The topics include: Radioactive fallout; Water supply; Sanitation of food service; Excreta disposal; Management of rufuse; Personal hygiene; Disinfestation and vermin control.

PB-215 932
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
THE LIVING WATERS.
1973, 24p PHS-Pub-382

Descriptors: (*Water resources, *Water pollution).

Briefly describes man's relationship with water resources and his pollution of them.

PB-215 933
Public Health Service, Washington, D.C.
WHY SOME SANITARY ENGINEERS LEAVE THE FIELD.
Monograph,
Irwin M. Rosenstock, and Arthur P. Miller. Apr 54, 22p PHS-M-21

Descriptors: (*Sanitary engineering, *Personnel management).

In 1951, the Division of Engineering Resources of the Public Health Service reported a study of 1,782 college graduates who had received undergraduate education in sanitary engineering in the 40-year period 1910-49. The results showed that a little more than half of that group were employed in the profession in 1950. The purpose of the present study is to find out why half of those who made a choice in favor of sanitary engineering as undergraduates were not practicing it in 1950. Identification of the reasons that cause graduates who have completed sanitary engineering courses to depart from the sanitary engineering work area may permit the formulation of measures to reduce the loss. (Author)

PB-215 934
Public Health Service, Cincinnati, Ohio. Bureau of Disease Prevention and Environmental Control.
REFUSE COLLECTION AND DISPOSAL, AN ANNOTATED BIBLIOGRAPHY 1958-1959. SUPPLEMENT D.
Public health bibliography series no. 4,
Edward R. Williams, and Ralph J. Black. 1967, 79p
See also report dated 1967, PB-215 951.

Descriptors: (*Waste disposal, Bibliographies), (*Refuse disposal, Bibliographies), Regional planning.
Identifiers: *Solid waste disposal.

The supplement covers the period 1958-1959, and is arranged in sections which correspond to the various administrative and operational phases of the broad field of refuse collection and disposal. The references have been annotated for increased usability as an aid in the exchange of information in both the research and operational phases of refuse sanitation activities. (Author)

PB-215 935
Public Health Service, Washington, D.C. Div. of Engineering Services.
HANDBOOK ON SANITATION OF DINING CARS IN OPERATION. STANDARDS OF SANITATION FOR OPERATION AND MAINTENANCE OF FOOD AND DRINK SERVICE FACILITIES ON RAILROAD PASSENGER CARS.

1959, 18p PHS-Pub-83-Rev-59
Supersedes PB-215 833.

Descriptors: (*Sanitary engineering, *Railroad cars), Food sanitation.

The handbook is designed to serve as a guide to those persons who must apply these principles to dining car operation and maintenance. The publication was prepared by the Interstate Carrier Section, General Engineering Program, of the Division of Sanitary Engineering Services, Public Health Service, and is one of a set of three handbooks on the subject of railroad sanitation.

PB-215 936
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
A STUDY OF THE POLLUTION AND NATURAL PURIFICATION OF THE SCIOTO RIVER,
Robert W. Kehr, W. C. Purdy, James B. Lackey, Oliver R. Placak, and William E. Burns. 1941, 174p
Public Health-Bull-276

Descriptors: (*Scioto River, *Water pollution), (*Ohio, Water pollution), Limnology.
Identifiers: *Self purification, *Water quality data.

Hydrometric, bacteriological, chemical, plankton, and bottom sediment studies were made of the Scioto River for 115 river miles below Columbus, Ohio, during a period of 30 months, involving three types of sewage treatment at Columbus, the point of heaviest pollution of the Scioto. Times of flow were determined for the stretch of river between Shadeville and Red Bridge 8 and 25 miles, respectively, below the point of entrance of Columbus sewage effluent. The bacteriological and chemical data were grouped according to three temperature and five discharge ranges. A careful examination of the physical properties and biological content of such sediments gives a reasonably accurate picture of average stream conditions. (Author Modified Abstract)

PB-215 937
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NITROGEN AND PHOSPHORUS IN WATER. AN ANNOTATED SELECTED BIBLIOGRAPHY OF THEIR BIOLOGICAL EFFECTS,
Kenneth M. Mackenthun. 1965, 139p PHS-Pub-1305

Descriptors: (*Water pollution, Nutrients), (*Nutrients, *Bibliographies), (*Limnology, Nutrients), Nitrogen, Phosphorus.

The book compiles a selected bibliography of literature with annotations specifically directed toward nitrogen and phosphorus and the ramifications of these and closely associated elements in the aquatic environment. Freshwater investigations have received preferential treatment but marine investigaions and research have been considered as such may relate or furnish clues to the solution of problems in freshwater. This book was compiled for the engineer and the scientist who are faced with predicting limnological changes resulting from nutirent loadings to standing bodies of water, with recognizing critical concentration values for algal development, and with predicting the effects of fertilizers on aquatic life. (Author Modified Abstract)

PB-215 938
Arctic Health Research Center, Anchorage, Alaska.
STUDIES ON HOUSING FOR ALASKA NATIVES.
Environmental health series: Arctic health,
Dennis R. Wik, William B. Page, and Michael L. Shank. Oct 65, 139p PHS-Pub-999-AH-1

Descriptors: (*Alaska, Houses), (*Arctic regions, *houses), Design.

The research described was begun in response to the critical health problems of Alaskan aboriginesin particular, high tuberculosis incidence and death rates. The expenditure of millions of dollars on tuberculosis treatment for a relatively small population clearly indicated the need for basic measures such as adequate housing. After an analysis of the technical problems relevant to housing construction in remote Alaskan villages, four experimental houses were designed and constructed in the field. Each was occupied by an Eskimo family; in return for rent-free occupancy, the householders maintained the houses and kept temperature records. The house construction types were plank-and-beam; rough lumber; commercial wood-stave water tank; and an extremely light shell mounted on a stable foundation (which could be adjusted to compensate for frost heaving). The results of the studies are presented.

PB-215 939
Communicable Disease Center, Atlanta, Ga.
POULTRY DISEASE IN PUBLIC HEALTH. REVIEW FOR EPIDEMIOLOGISTS,
Mildred M. Galton, and Paul Arnstein. 1960, 47p
PHS-Pub-767
Errata sheet inserted.

Descriptors: (*Public health, Bird diseases), (*Bird diseases, Poultry), (*Poultry, Public health), (*Infectious diseases, Poultry), (*Epidemiology, Bird diseases), Animal diseases, Disease vectors, Bacterial diseases, Fungus diseases, Viral diseases, Parasitic diseases, Veterinary medicine, Food.

The report reviews the current public health aspects of the following diseases involving man and fowls: Bacterial: Salmonelloais, paracolon infections, erysipelas, staphylococcal infections, streptococcal infections, tuberculosis, brucellosis, listeriosis, tularemia, pasteurellosis, pseudotuberculosis, diphtheria, anthrax, botulism, and leptospirosis. Viral: Equine encephalomyelitis, Newcastle disease and ornithosispsittacosis. Fungal: Favus, thrush, aspergillosis, and histoplasmosis. Parasitic: Dermanyssus gallinae, toxoplasmosis.

PB-215 940
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
REPORT OF PUBLIC HEALTH SERVICE TECHNICAL COMMITTEE ON PLUMBING STANDARDS.
Sep 62, 143p PHS-Pub-1038

Descriptors: (*Plumbing, *Standards).

The report presents national plumbing standards in the following areas: Materials; Joints and connections; Traps and cleanouts; Interceptors, separators and backwater valves; Plumbing fixtures; Hangers and supports; Indirect waste piping and special waste; Water supply and distribution; Drainage system; Vents and venting; Storm drains; Inspection, tests and maintenance; Individual water supply; Individual sewage disposal system; Hospital plumbing; Sizing the building water supply distribution system; and Plumbing ordinance.

PB-215 941
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WATER POLLUTION CONTROL. SEWAGE TREATMENT. WATER TREATMENT. SELECTED BIOLOGICAL REFERENCES,
Bibliography series,
William M. Ingram, and Kenneth M. Mackenthun. 1963, 146p PHS-Pub-1053, PHS-BS-8-Rev-63

Descriptors: (*Water pollution, Fresh water biology), (*Bibliographies, Fresh water biology).

The report of selected biological references on water pollution control include a number of related topics ranging from specific groups of organisms to those techniques used to determine changes in the environment and methods used in reporting data. Much literature is of relatively recent origin. The general expansion of the biological field, the introduction of new factors for consideration, e.g., radioactivity, new insecticides, and a wide range of pollutants for bio-assay, have stimulated research on the short- and long-range impact of these materials.

PB-215 942
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
TIME-TEMPERATURE EFFECTS ON SALMONELLAE AND STAPHYLOCOCCI IN FOODS: II. BEHAVIOR AT WARM HOLDING TEMPERATURES THERMAL-DEATH-TIME STUDIES.
Milk and Food Research Program,
Robert Angelotti, Milton J. Foter, and Keith H. Lewis. 1960, 53p SEC-TR-F59-2, SEC-TR-F60-5

Descriptors: (*Food sanitation, Heat treatment), (*Salmonella, Food sanitation), (*Staphylococcus, Food sanitation).

The most commonly reported types of foodborne disease outbreaks are caused by salmonellae and staphylococci. A practical method of preventing foodborne disease outbreaks is the application of temperatures that will inhibit or destroy the causative organisms in perishable foods. Toward this end, studies were undertaken to establish experimentally the temperature limits for growth of salmonellae and staphylococci in ham salad, chicken a la king, and custard in the range of 95F to 120F. In addition, thermal-death-time studies were conducted on salmonellae and staphylococci in the same foods at 5F intervals from 130F to 150F. (Author)

PB-215 943
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
A STUDY OF INDUSTRIAL WASTE POLLUTION IN THE SOUTH PLATTE RIVER BASIN. APPENDIX A. INDUSTRIAL PLANTS VISITED AND NOT SAMPLED.
Dec 66, 84p PR-6A
See also Appendix B, PB-215 944.

Descriptors: (*Platte River Basin, *Water pollution), (*Industrial wastes, Platte River Basin), (*Colorado, Water pollution), Inventories, Industries.
Identifiers: *Denver (Colorado).

A two and one-half year Industrial Waste Survey in the South Platte River Basin was culminated by the Federal Water Pollution Control Administration, South Platte River Basin Project in late 1966. The highlights of this survey together with major recommendations on pollution abatement by industry are given in the basic report entitled 'A Study of Industrial Waste Pollution in the South Platte River Basin.' The appendices represent a supplementary issue to the main report. However, these appendices are essential to an understanding of the main survey and the primary document. This report gives pertinent information on the waste problems of 58 industrial companies. These plants were all visited but no waste sampling was undertaken by personnel of the South Platte River Basin Project. (Author Modified Abstract)

PB-215 944
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.

A STUDY OF INDUSTRIAL WASTE POLLUTION IN THE SOUTH PLATTE RIVER BASIN. APPENDIX B. INDUSTRIAL PLANTS VISITED AND SAMPLED.

Dec 66, 150p PR-6B
See also Appendix A, PB-215 943.

Descriptors: (*Platte River Basin, *Water pollution), (*Industrial waste treatment, Platte River Basin), (*Colorado, Water pollution), Industries, Inventories.
Identifiers: *Denver (Colorado).

A two and one-half year Industrial Waste Survey in the South Platte River Basin was culminated by the Federal Water Pollution Control Administration, South Platte River Basin Project in late 1966. The highlights of this survey together with major recommendations on pollution abatement by industry are given in the basic report entitled 'A Study of Industrial Waste Pollution in the South Platte River Basin.' The appendices represent a supplementary issue to the main report. The report presents detailed data on the waste handling and abatement procedures employed by 33 specially-selected industrial companies together with waste sampling results. (Author Modified Abstract)

PB-215 945
National Field Investigations Center, Cincinnati, Ohio.
INVESTIGATION OF MERCURY IN THE ST. CLAIR RIVER - LAKE ERIE SYSTEMS.

May 70, 115p

Descriptors: (*Saint Clair River, *Mercury), (*Lake Erie, *Mercury), (*Water pollution, *Lake Erie), Michigan, Canada.
Identifiers: *Water quality data.

The report presents results from a water and sediment sampling and analysis program for mercury in the St. Clair River -- Lake Erie system immediately after the Canadian government announced the fishing ban in Lake St. Clair on March 24, 1970.

PB-215 946
Michigan Univ., Ann Arbor. Dept. of Civil Engineering.
ADSORPTION FROM AQUEOUS SOLUTION.
Progress rept. 1 Jan 64-30 Dec 66,
Walter J. Weber, Jr. 12 Dec 66, 163p 07799-1-P
Grant PHS-WP-00706

Descriptors: (*Activated carbon treatment, *Organic compounds), Performance evaluation, Adsorption.
Identifiers: *Water pollution control.

A number of different aspects of the adsorption of perdurable pollutants by carbon from aqueous solution have been studied to provide information for evaluation of the fluid-solid technique for treating waters and wastes. For all studies, attempts have been made to relate column behavior to behavior in rapidly agitated non-flow systems.

PB-215 947
Federal Water Quality Administration, Washington, D.C. Training Program.
SEWAGE TREATMENT FACILITIES FOR FEDERAL INSTALLATIONS.

Oct 70, 256p

Descriptors: (*Sewage treatment, *Manuals), Education.

The training program is offered to supervisors, engineers, and other Federal personnel responsible for design, construction, or management of sewage disposal facilities at Federal installations. The course includes waste treatment methods which are applicable to Federal installations such as National Parks, Forest Service camps, small military installations, hospitals, schools and prisons. (Author)

PB-215 948
Federal Water Pollution Control Administration, Washington, D.C.
WATER POLLUTION CONTROL RESEARCH AND TRAINING GRANTS: INDEX OF 1962-1964 RESEARCH GRANT PUBLICATIONS AND REPORTS.
1964, 60p

Descriptors: (*Water pollution, *Grants), Indexes (Documentation).

The index is a source document for the retrieval of references to the known literature which has resulted from research grants awarded under the Federal Water Pollution Control Act during 1962, 1963, and 1964. It is designed to provide a useful record of the literature references credited to water pollution control research grant projects, and to facilitate communication between investigators. The 545 references to publications and reports have resulted from 143 projects, an average of 3.8 per grant.

PB-215 949
Public Health Service, Kansas City, Mo. Region VI.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, OSAGE RIVER BASIN, KANSAS AND MISSOURI: STUDY OF NEEDS AND VALUE OF STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL.
Aug 65, 70p

Descriptors: (*Osage River Basin, *Reservoirs), (*Kansas, *Water resources), (*Missouri, *Water resources), Water consumption.

A survey has been made which discloses immediate and future needs for municipal and industrial water supplies and storage for streamflow regulation for the purpose of water quality control. Future needs are based on results of economic and demographic studies projecting population and industrial growth. (Author)

PB-215 950
Consumer Protection and Environmental Helath Service, Washington, D.C.
PROCEEDINGS OF THE SYMPOSIUM ON HUMAN ECOLOGY HELD AT AIRLIE HOUSE, WARRENTON, VA., 24-27 NOV 68.
1968, 130p

Descriptors: (*Humans, *Ecology), (*Pollution, *Public health).
Identifiers: *Quality of life.

Soon after its organization, the Consumer Protection and Environmental Health Service hosted representatives of various professional fields concerned with man and his environment at a 3-day symposium on human ecology in order to share viewpoints and recommendations. The proceedings include the formal papers presented summaries of the plenary discussions that followed, a digest in the small-group meetings, and a summary of the concluding session.

PB-215 951
Public Health Service, Cincinnati, Ohio. Disease Prevention and Environmental Control.
REFUSE COLLECTION AND DISPOSAL, AN ANNOTATED BIBLIOGRAPHY, 1956-1957. SUPPLEMENT C.
Public health bibliography series no. 4,
Edward R. Williams. 1967, 55p
See also report dated 1959, PB-215 934.

Descriptors: (*Waste disposal, Bibliographies), (*Refuse disposal, *Bibliographies), Regional planning.
Identifiers: *Solid waste disposal.

The report covers the period 1956-1957, and is arranged in sections which correspond to the various administrative and operational phases of the broad field of refuse collection and disposal. The references have been annotated for increased usability as an aid in the exchange of information in both the research and operational phases of refuse sanitation activities. (Author)

PB-215 952
Public Health Service, Cincinnati, Ohio. Bureau of Disease Prevention and Environmental Control.
SOLID WASTE HANDLING IN METROPOLITAN AREAS.

Jan 68, 44p
Revision of report dated Feb 64.

Descriptors: (*Waste disposal, *Urban planning), (*Public health, Waste disposal).
Identifiers: *Solid waste disposal.

The report concerns urban solid waste disposal and its problems with public health and land development. The topics discussed include: Economic impact; Legal aspects; Effect of community differences and technological advances; Lack of public concern; Development of standards; The metropolitan-wide approach; State and local action; Role of the Public Health Service; and Policy questions.

PB-215 953
Federal Water Pollution Control Administration, Washington, D.C.
THE IDENTIFICATION AND MEASUREMENT OF CHLORINATED HYDROCARBON PESTICIDES IN SURFACE WATERS,
A. W. Breidenbach, J. J. Lichtenberg, C. F. Henke, D. J. Smith, and J. W. Eichelberger, Jr.
1964, 80p

Descriptors: (*Chlorine organic compounds, Water analysis), (*Pesticides, *Water analysis), (*Activated carbon, Water analysis), Gas chromatography, Infrared spectroscopy.
Identifiers: *Water pollution detection.

The report describes the use of activated carbon in the analysis of chlorinated pesticides in water. The topics include: Carbon adsorption sampling; The carbon adsorption method (CAM); Preparation of samples preliminary to gas chromatographic analysis; Gas chromatography; Infrared spectrophotometry; Interferences; and Sensitivity and specificity.

PB-215 954
Public Health Service, Washington, D.C. Div. of Health Mobilization.
WATER SUPPLY MANAGEMENT IN THE PACKAGED DISASTER HOSPITAL.
Health mobilization series.

1965, 40P PHS-Pub-1071-F-6

Descriptors: (*Hospitals, *Water supply), (*Nuclear warfare defense, Water supply).

In the event of a thermonuclear attack on the United States, it is assumed that a major proportion of existing hospital facilties would be destroyed. In recognition of these facts, the U.S. Public Health Service has pre-positioned Packaged Disaster Hospitals (PDH's) in communities throughout the nation. The PDH is a unit of supplies and equipment which, in disaster, can be set up in an existing building, such as a school, to supply an austere but functional general hospital. The booklet is the sixth in a series developed to assist those persons in a community responsible

for preparing to use the PDH in a disaster. It discusses water conservation techniques, suggests guidelines for meeting the emergency water requirements of the PDH (both quantity and quality), and contains sufficient information to be used as a training manual for familiarizing assigned operating personnel with their responsibilities and with actions required to activate the water supply section.

PB-215 955
Public Health Service, Washington, D.C. Div. of Sanitation.
INDIVIDUAL WATER SUPPLY SYSTEMS.
1950, 68p PHS-Pub-24-Rev-50
Report on Recommendations of the Joint Committee on Rural Sanitation. For 1962 revision, see PB-215 858.

Descriptors: (*Water wells, *Design), National government, Government policies.

The development of safe and adequate supplies of drinking water for individual homes is essential and necessary to protect the health of the individuals residing in suburban areas. Urban fringe areas are often beyond the reach of municipal water systems, and individual wells or a community distribution system must be provided to serve the properties with a safe supply of water. The accelerated rate of housing construction has greatly aggravated environmental health problems, especially in fringe areas and rural communities. The recommendations of the Joint Committee are presented primarily for the purpose of establishing a uniform approach for various Federal agencies concerned with the sanitation of individual water supplies. (Author)

PB-215 956
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SEWAGE TREATMENT PLANT CONSTRUCTION COST INDEX. CONSTRUCTION COST TRENDS MUNICIPAL WASTE TREATMENT WORKS.
1963, 37p PHS-Pub-1069

Descriptors: (*Sewage treatment, *Construction costs), Trends, Cost analysis, Indexes (Ratios).
Identifiers: *Sewage treatment plants.

Grants-in-aid for municipal waste treatment works construction authorized under the Federal Water Pollution Control Act in 1956, have been accompanied by a steady increase in the dollar volume of construction contracts awarded for these facilities. An accurate assessment of the increased construction activity and estimate of future construction needs require a thorough understanding of the changing purchasing power of the local and Federal funds invested in waste treatment works construction. Since waste treatment works have generally been considered to follow the ENR Construction Cost Index, a comparison of this index to the Public Health Service Sewage Treatment Plant (PHS-STP) Construction Cost Index was undertaken.

PB-215 957
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
FABRICATION OF SINGLE SERVICE CONTAINERS AND CLOSURES FOR MILK AND MILK PRODUCTS. GUIDE FOR SANITATION STANDARDS.

1966, 14p PHS-Pub-1465
Errata sheet inserted.

Descriptors: (*Milk, *Food packaging), (*Food sanitation, Milk), Standards.

The standards serve as a guide to insure the continued production of consistently sanitary containers and closures for milk and milk products, as defined in the Pasteurized Milk Ordinance. The requirements of the standard apply to all blank fabricators, closure manufacturers, plastic laminators, sheet formers, blow molders, vacuum formers, extruders, injection molders, preformers, and similar plants; also to the installation and maintenance of equipment used in compounding materials for the fabrication, production, handling, and storage of single-service containers and closures. (Author)

PB-215 958
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
PROBLEMS IN FINANCING SEWAGE TREATMENT FACILITIES.
1962, 21p PHS-Pub-886

Descriptors: (*Sewage treatment, *Financing).
Identifiers: *Sewage treatment plants.

The report deals with the problem of financing sewage treatment facilities, a problem which is central to this country's overall program of water pollution control. It deals with the available methods of financing, the difficulties associated with each method, and the extent to which the methods and the difficulties are a product of the economic system or a product of the ecology of local government. Suggestions for ameliorative action are also identified and examined.

PB-216 065
National Field Investigations Center - Denver, Colo.
PROCEEDINGS OF SEMINAR ON THE SIGNIFICANCE OF FECAL COLIFORM IN INDUSTRIAL WASTES, MAY 4-5, 1972,
Robert H. Bordner, and Bobby J. Carroll. Jul 72, 191p TR-3

Descriptors: (*Water pollution, Coliform bacteria), (*Industrial wastes, *Coliform bacteria), (*Indicator species, *Coliform bacteria), (*Klebsiella, Water pollution), Standards, Nutrients.
Identifiers: Pathogens.

A group of EPA microbiologists, sanitary engineers, and other concerned participants held a seminar to discuss the significance of fecal coliforms in certain industrial wastes and the use of bacteriological parameters as effluent standards in the permit program. The topics discussed include: History and background on occurrences of fecal coliforms in industrial wastes; Experiences with coliform and enteric organism isolation from industrial wastes; Observations of selected waste discharges from Region IX; Review of research regarding coliforms in pulp and paper mill wastes; Brief literature review of Klebsiella as pathogens; The detection and significance of Klebsiella in water; Considerations for permit preparation pulp and paper industry; and Experiences with coliform and enteric organism isolations from industrial wastes.

PB-216 092
Federal Water Pollution Control Administration, Washington, D.C.
ANALYTICAL TECHNIQUES FOR THE NATIONAL EUTROPHICATION RESEARCH PROGRAM.
Clean water rept.

Jun 69, 145p

Descriptors: (*Water analysis, *Manuals), (*Water pollution, Water analysis).
Identifiers: *Water pollution detection.

The manual presents techniques for measuring the following water quality factors: pH; Alkalinity; Total organic carbon; Soluble organic carbon; Total carbon; Dissolved oxygen; Nitrate; Nitrite; Ammonia; Kjeldahl nitrogen; Phosphorus; Silica; Conductivity; Total solids, total residue; Total suspended solids; Turbidity; Color; Chloride; Total hardness; Trace metals; Arsenic; Boron; and Chlorophyll.

PB-216 093
Public Health Service, Washington, D.C.
SAMPLING MICROBIOLOGICAL AEROSOLS. Monograph,
Harold W. Wolf, Peter Skaliy, Lawrence B. Hall, Herbert M. Decker, and Lee M. Buchanan. Apr 59, 60p PHS-M-60, PHS-Pub-686
Library of Congress Catalog card no. 59-60091.

Descriptors: (*Biological aerosols, *Gas sampling), (*Aerobiology, Gas sampling), (*Air pollution, *Bacteria), Samplers.
Identifiers: *Air pollution detection.

The report discusses the following: Bacterial air sampling methods (Impingement in liquids, Impaction on solid surfaces, Filtration, Sedimentation, Centrifugation, Electrostatic precipitation, and Thermal precipitation); Particle sizing; Selection of samplers; Operational methods; Normal bacterial levels; Description of samplers and equipment.

PB-216 094
Florida Univ., Gainesville.
TO DEMONSTRATE THE EFFECTIVENESS OF IODINE FOR THE DISINFECTION OF PUBLIC WATER SUPPLIES AND TO DETERMINE THE PHYSIOLOGICAL EFFECTS ON A HUMAN POPULATION.
Progress rept. no. 6, 1 Mar 67-29 Feb 68,
A. P. Black. 1 Mar 68, 74p
Grant WPD-19-05-67

Descriptors: (*Water treatment, *Iodination), (*Disinfectants, *Iodine), Potable water, Water supply, Dosage, Ingestion (Biology), Public health, Gainesville (Florida), Florida, Bactericides, Algicides.

The production of objectionable tastes and odors during the period of experimental iodination of the municipal water supply of Gainesville, Florida in 1967 emphasized the importance of a better understanding of the types of compounds which are formed by the reaction of various types of organic compounds present in polluted water with disinfecting concentrations of elemental iodine. The taste threshold concentrations of iodine, free chlorine, and monochloramine were determined. Studies of the disinfection of swimming pool water have further demonstrated the effectiveness of iodine as a sanitizing agent, have shown that staphylococci are controlled more effectively by iodine than by chlorine, and that iodine does not control the growth of algae. A five year study of the physiological effect of iodine on a human population at the prisons at Lowell, indicate that no undesirable effects have resulted from the ingestion of a water disinfected with a dosage of 1.0 ppm of iodine.

PB-216 095
Public Health Service, Cincinnati, Ohio. Office of Stream Sanitation.
GRAND (NEOSHO) RIVER INVESTIGATION (KANSAS, OKLAHOMA, MISSOURI, ARKANSAS),
Mark D. Hollis, Richard L. Woodward, Sam R. Weibel, and Paul D. Haney. Aug 40, 122p

Descriptors: (*Grand River, *Reservoirs), (*Neosho River, Reservoirs), (*Kansas, Water resources), (*Oklahoma, Water resources), (*Missouri, Water resources), (*Arkansas, Water resources), Water pollution.

The report describes an investigation of the Grand (Neosho) River to correlate the need, value, and effect of conservation storage in proposed flood control reservoirs with public water supply use and stream pollution control. Locally, there is

definite need and demand for low flow control, and this demand can be met most equitably by flow regulation from conservation storage in proposed flood control reservoirs. Optimum conservation storage as proposed at Council Grove and Marion is theoretically sufficient for minimum water supply and dilution requirements. (Author)

PB-216 096
Public Health Service, Washington, D.C.
A STUDY OF THE POLLUTION AND NATURAL PURIFICATION OF THE UPPER MISSISSIPPI RIVER. SURVEYS AND LABORATORY STUDIES,
H. R. Crohurst. Dec 32, 127p PHS-Bull-203

Descriptors: (*Missis ippi River Basin, *Water pollution).
Identifiers: *Water quality data, *Self purification.

The report, therefore, contains data relative to the physical features of the upper Mississippi River watershed and the river channel; summaries of total and sewered population, with estimates of sewered population equivalent to the industrial waste pollution; estimates of discharge and times of flow; and a summary of the chemical and bacteriological findings at various points on the section of the river under investigation. These data are presented in a series of basic tabulations, condensed to the form of monthly averages, with a discussion of the salient features of each.

PB-216 097
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
RESEARCH AND FIELD LABORATORIES FOR WATER POLLUTION CONTROL.

1964, 24p PHS-Pub-1102

Descriptors: (*Water pollution, *Laboratories).

The report describes the location and goals of new research and field laboratories for water pollution control. These laboratories will be in Boston, Mass.; Athens, Ga.; Ann Arbor, Mich.; Ada, Okla.; Covallis, Ore.; College, Alaska; Kingston, R.I.; and Duluth, Minn.

PB-216 098
Federal Water Pollution Control Administration, Washington, D.C.
POLLUTION CAUSED FISH KILLS - 1968.
Annual rept. no. 9.
1968, 19P

Descriptors: (*Water pollution, Fishes), Inventories.
Identifiers: *Fishkill, *Water pollution effects (Animals).

In 1968 an estimated 15,236,000 fish were reported killed in 42 States by identifiable pollution sources. Listed are pollution sources and locations of these kills.

PB-216 099
Robert S. Kerr Water Research Center, Ada, Okla.
LABORATORY QUALITY CONTROL MANUAL.

1969, 105p

Descriptors: (*Water analysis, Quality control), Records management, Handbooks.

The Federal Water Pollution Control Administration (FWPCA) is concerned about laboratory quality and has initiated a program of improved effort in that direction. The manual deals with two areas of that program; statistical analytical quality control and record keeping. The manual describes statistical techniques as applied to analytical quality control. It is also concerned with record keeping as it applies to laboratory procedures and suggests a method of laboratory record keeping that should satisfy the most severe critic.

PB-216 100
Houston Univ., Tex. Dept. of Civil and Environmental Engineering.
PROCEEDINGS OF NATIONAL INDUSTRAIL SOLID WASTES MANAGEMENT CONFERENCE HELD IN HOUSTON, TEX., 24-26 MAR 70.
1970, 497p
Sponsored in part by Bureau of Solid Waste Mangement, Rockville, Md. Library of Congress catalog card no. 72-88009.

Descriptors: (*Waste disposal, *Meetings).
Identifiers: *Solid waste disposal.

Contents:
- General;
- Classification and characterization of industrial solid wastes;
- Size reduction, sorting, segregation, and densification operations;
- Collection, transportation, and storage of solid wastes;
- Incineration;
- Biomass handling techniques, biodegradation and bioconversion of industrial solid wastes;
- Terrestrial and oceanic practices in management of solid wastes;
- Metallic solid wastes in secondary material industry;
- Paper and wood product solid waste in secondary material industry;
- Terrestrial practices in management of solid wastes;
- Industrial profiles - basic industries;
- Pyrolysis;
- Planning and development of joint community industry programs and facilities for solid wastes management.

PB-216 101
Environmental Health Center, Cincinnati, Ohio.
INVESTIGATION OF A PROPOSED RECIRCULATION SYSTEM FOR TOILET WASTES,
James B. Coulter, John F. Kopp, and David A. Thiemann. 1 Jul 52, 20p

Descriptors: (*Houses, Sewage treatment), (*Toilet facilities, *Sewage treatment), Aeration.

Two trials of a proposed system for the disposal of toilet-waste were made. The system investigated in the first trial consisted of three functional units: a grinder-type toilet, a receiving tank and a small pump. The hydraulically driven grinder was located below the bowl in the base of the toilet. The pump, operating continously, recirculated the tank contents through the toilet, furnishing power to drive the grinder, and liquid to flush the toilet. Solid particles deposted in the toilet bowl were flushed into the grinder where they were finely ground and carried in the liquid by gravity flow from the toilet to the receiving tank on the floor below. No effluent was discharged from the system. (Author)

PB-216 102
Federal Water Quality Administration, Portland, Oreg. Northwest Region.
INTERAGENCY PROGRAM REVIEWS.
1970, 100p

Descriptors: (*Water pollution, Government policies).
Identifiers: *Government agencies.

An objective of our 1970 work plans for the Federal Activities Coordination Branch was to conduct program reviews with agency heads for the purpose of establishing procedures for coordination and implementation of a program for controlling the pollution from Federal installations and activities. Top level discussions were held between FWQA and agency heads in FY 1970 to discuss and clarify the coordination and application of water quality control. The agencies dealt with included: Bureau of Land Management; Corps of Engineers; U. S. Forest Service; Bureau of Indian Affairs; and Soil Conservation Service.

PB-216 104
Thomas, Dean and Hoskins, Inc., Great Falls, Mont.
COMPREHENSIVE STUDY OF SOLID WASTE DISPOSAL IN CASCADE COUNTY, MONTANA.
Final rept.

1970, 200P EPA-SW-6d, PHS-Pub-2002
Grant PHS-UI-00095
Paper copy available from GPO $2.00 as HE1402:C26.

Descriptors: (*Waste disposal, *Montana).
Identifiers: *Cascade County (Montana).

The report considers the various forms of solid wastes and the related problems in their storage, collection and disposal. It discusses in detail the entire solid waste problem and methods to improve existing conditions.

PB-216 105
Johns Hopkins Univ., Baltimore, Md. Dept. of Geography and Environmental Engineering.
MATHEMATICAL ANALYSIS OF SOLID WASTE COLLECTION.
Final rept.,
David H. Marks, and Jon C. Liebman. 1970, 204p
EPA-SW-5rg, PHS-Pub-2104
Grant PHS-EC-00309
Library of Congress catalog card no. 73-608768.
Paper copy available from GPO $1.50 as HE20.1402:M42/2.

Descriptors: (*Waste disposal, *Collecting methods), Mathematical models.
Identifiers: *Solid waste disposal, *Baltimore (Maryland).

The application of operations research to the analysis of solid waste collection systems was studied. Models and techniques for facility location and routing are discussed and extended. Three different types of problem areas are viewed. Facility location, in particular the location of transfer facilities within a large-scale system was covered. The finding of optimal flow through given systems with added constraints is also discussed. One chapter is concerned with vehicle scheduling problems where routes are to be found for individual collection vehicles among various tasks. Finally, the analysis of an actual large-scale solid waste collection system, that of Baltimore, Maryland, is carried out using some of the methods developed. (Author Modified Abstract)

PB-216 107
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
LIMNOLOGICAL ASPECTS OF RECREATIONAL LAKES,
Kenneth M. Mackenthun, William Marcus Ingram, and Ralph Porges. 1964, 188p PHS-Pub-1167

Descriptors: (*Lakes, *Limnology), (*Recreational facilities, *Water quality).

The enrichment of waters in natural basins often brings about biological excesses that are inimical to recreational and other water uses. The demand for clean, nuisance-free water, ever increasing with more leisure time and the growing population, will exert pressure for pollution abatement and water management to minimize nuisances. The book is written for persons involved in interpreting

and managing the biological problems and associated phenomena of recreational lakes.

PB-216 108
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY: MUNICIPAL WASTE FACILITIES, 1962. REGION VIII. COLORADO, IDAHO, MONTANA, UTAH, WYOMING.
1963, 71p PHS-Pub-1065-Vol-8

Descriptors: (*Water pollution, *Colorado), (*Water pollution, *Idaho), (*Water pollution, *Montana), (*Water pollution, *Utah), (*Water pollution, *Wyoming), Inventories, Sources, Sewage.

The inventory contains the latest available data for all sources of municipal pollution in Region VIII which are of significance in water pollution control programs. Each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Entries listed under the same community are alphabetized by name, under that community. Following each State listing is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-216 109
Texas Univ., Austin. Center for Research in Water Resources.
BACTERICIDAL EFFECTS OF ALGAE ON ENTERIC ORGANISMS.
Water pollution control research series,
Ernst M. Davis, and Earnest F. Gloyna. Mar 70, 141p FWQA-18050-DOL-03/70

Descriptors: (*Algae, Bacteria), (*Bacteria, *Biodeterioration), Water pollution.

A series of experiments involving the effects of blue-green and green algae on the dieoff rates of selected bacteria have been conducted. Cultures of the normal blue-green contaminants were exposed to the enterics to determine antagonistic effects toward the enterics. Filtrate from actively growing algae was exposed to cultures of enterics to determine whether any antibiotic compounds were imparted to the medium during lag phase growth of algae. To determine aftergrowth of the enteric species, the duration of the tests was extended to about 90 days. Mixed cultures of green and blue-green algae were exposed to both single species of enteric bacteria and mixed cultures. The results indicated that mixed algal cultures cause a greater dieoff among the enteric bacteria than do individual species of algae. The dieoff characteristics of pathogenic species were also determined. The pathogenic species did not survive as long as the enteric test species under similar test conditions. Virtually no aftergrowth was detected on the part of the pathogens. (Author)

PB-216 110
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
DRINKING WATER QUALITY OF SELECTED INTERSTATE CARRIER WATER SUPPLIES, 1962 - 1963,
Michael Spear. 1965, 189p PHS-Pub-1049-A

Descriptors: (*Water supply, *Water quality), (*Water treatment, Water quality), (*Potable water, Water quality), Inventories.
Identifiers: *Water quality data.

The drinking water quality of selected interstate carrier water supply sources was determined. Samples of water were analyzed for organic chemicals, radiochemicals and trace elements and other determinations generally classed as sanitary chemical analyses. The results for each water treatment plant are presented in a standard manner, together with certain other distinguishing information.

PB-216 111
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
POLLUTION-CAUSED FISH KILLS IN 1962.
Annual rept. no. 3.

1962, 23P PHS-Pub-847-62
See also PB-216 112.

Descriptors: (*Water pollution, Fishes), Inventories.
Identifiers: *Fishkill, *Water pollution effects (Animals).

This publication is the third annual report of fish kills caused by pollution occurring in the United States. This report includes all fish kills in 1902 which were reported by the various State agencies. Even though the resulting totals of fish killed are large, they probably represent only a fraction of fish actually killed throughout the United States by man-made pollution.

PB-216 112
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
POLLUTION-CAUSED FISH KILLS IN 1963.
Annual rept. no. 4.

1963, 30P PHS-Pub-847-63
See also PB-216 111.

Descriptors: (*Water pollution, Fishes), Inventories.
Identifiers: *Fishkill, *Water pollution (Animals).

A total of 6,816,530 fish were reported killed by water pollution in the United States in the year ending December 31, 1963, as compared to 6,200,000 the previous year. This fourth annual fish kill report shows that pollutants arising from industrial operations led all categories both as to number of kills and number of fish. Agricultural operations, chiefly pesticides, were second in number. For the first time, this report categorizes pollution attributable to 'transport operations' which accounts for accidental spills of chemicals and other toxic substances in transit.

PB-216 113
Communicable Disease Center, Atlanta, Ga.
PROCEEDINGS OF THE NATIONAL CONFERENCE ON SALMONELLOSIS HELD AT THE COMMUNICABLE DISEASE CENTER IN ATLANTA, GEORGIA ON MARCH 11 THROUGH MARCH 13, 1964,
James L. Goddard. Mar 65, 217p PHS-Pub-1262

Descriptors: (*Salmonella, *Meetings), (*Bacterial diseases, Salmonella), (*Public health, Salmonella), Epidemiology, Infections, Disease vectors, Food contamination, Poultry, Feeding stuffs, Hospitals.

In light of the extent and importance of the salmonellosis problem in the United States, the Communicable Disease Center sponsored a National Conference on Salmonellosis that was held in Atlanta, Georgia, March 11 through March 13, 1964. Over 200 representatives from State and Federal agencies, industry, and universities attended. The multiple interrelated facets of the problems associated with salmonellosis were presented in formal papers and discussed in informal sessions. The monograph is the record of the conference, and includes the formal papers presented and the pertinent data reported during the several discussion sessions. (Author)

PB-216 114
Federal Water Quality Administration, Washington, D.C. Div. of Applied Sciences and Technology.
PROJECTS OF THE INDUSTRIAL POLLUTION CONTROL BRANCH.
Water pollution control research series.
Jul 70, 231p FWQA-12000-07/70
See also PB-189 766.
Paper copy available from GPO $1.75 as I67.13/4:12000-07/70.

Descriptors: (*Water pollution, Research), Grants, Industries.
Identifiers: *Water pollution control.

The report discusses the purpose of the Control Branch and presents summaries of the projects it funds.

PB-216 115
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME IV. STATE AND MAJOR RIVER BASIN MUNICIPAL TABLES.

10 Jan 68, 49p

Descriptors: (*Water pollution, *Cost analysis), Tables (Data).
Identifiers: *Water pollution economics.

The Federal Water Pollution Control Act (Section 16 (a)) directs the Secretary of the Interior to conduct a comprehensive analysis of the national requirements for, and the cost of, treating municipal, industrial, and other wastewater effluents to attain water quality standards established under the Act. This first analysis is required to be submitted to the Congress by January 10, 1968, to cover Fiscal Years 1969-1973, inclusive, and to be updated each year thereafter. This is Volume IV of the report (State and Major River Basin Municipal Tables) containing a tabular breakdown of estimated construction costs of municipal treatment works and sanitary sewers, and the operation and maintenance costs of treatment works. The data are shown for each of the 50 states and District of Columbia and the Nation's major river basins as described by the Water Resources Council.

PB-216 116
Federal Water Pollution Control Administration, Washington, D.C. Div. of Technical Support.
THE PRACTICE OF WATER POLLUTION BIOLOGY,
Kenneth M. Mackenthun. 1969, 293p
Paper copy available from GPO $1.50 as I67.8:W29.

Descriptors: (*Water pollution, *Biological surveys).
Identifiers: *Water pollution effects (Animals), *Water pollution effects (Plants).

Contents: Aquatic environments; Water quality constituents; Organic wastes; Silts; Toxic materials; Acid mine wastes; Radioactive wastes; Eutrophication; Marine environments; Water treatment; Waste treatment; Slimes; Nuisance organisms; Nuisance organism control.

PB-216 117
Management Technology, Inc., Washington, D.C.
AUTOMOBILE SCRAPPING PROCESSES AND NEEDS FOR MARYLAND.
Final rept.

1970, 77P PHS-Pub-2027
Grant PHS-UI-00187
Library of Congress Catalog Card no. 73-605837.
Paper copy available from GPO $1.25 as HE20.1402:AU8.

Descriptors: (*Waste disposal, *Automobiles), (*Maryland, Waste disposal), Metal scrap.
Identifiers: *Junk car disposal.

Considering the abandoning, collecting, storing, disposing, salvaging, and processing of junked

cars as an integrated system, the authors analyzed each component of the system-the Junked Car, the Abandoned Car, the Impounded Car, the Auto Dismantler, the Scrap Processor, the Scrap User-and identified seven problem areas in the system, each requiring a solution. Based upon the data collected, alternative approaches to each problem were evaluated. In the evaluation, all alternatives, based on both technological changes in the private sector and suggested government actions, were analyzed to determine the effect of each on all problems and components of the system. Finally, a set of conclusions and recommendations was developed. (Author Modified Abstract)

PB-216 118
Public Health Service, Denver. Colo. Region VIII.
MUNICIPAL WATER FACILITIES. INVENTORY AS OF JANUARY 1, 1958. VOLUME 8: COLORADO, IDAHO, MONTANA, UTAH, WYOMING. A COOPERATIVE STATE-FEDERAL REPORT.

1960, 58p PHS-Pub-775
Grant WPD-74

Descriptors: (*Water supply, *Colorado), (*Water supply, *Idaho), (*Water supply, *Montana), (*Water supply, *Utah), (*Water supply, *Wyoming), (*Water treatment, Inventories).

The report is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more. The listing is alphabetic by name of place within the State. At the end of each State listing there appear the names of all places having a 1950 population of 100 or more but which were not reported as having a community water supply. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-216 119
Public Health Service, Washington, D.C. Bureau of State Services.
MUNICIPAL SEWAGE TREATMENT NEEDS,
John R. Thoman, and Kenneth H. Jenkins. 1958, 19p PHS-Pub-619
See also PHS-Pub-609, PB-216 146.

Descriptors: (*Sewage treatment, Forecasting).

A general summary of data relating to sewer systems and sewage disposal in the United States was recently prepared by the Public Health Service. This summarization of physical facilities data was based on the 1957 Inventory of Sewage and Industrial Waste Facilities. The Inventory also contained information on reported needs both for present treatment plants and for systems discharging raw sewage. The present report presents summarized information on these sewage disposal requirements.

PB-216 120
Public Health Service, Washington, D.C.
FACTS ABOUT THE FEDERAL WATER POLLUTION CONTROL ACT OF 1956 - INFORMATION, TECHNICAL RESEARCH, TECHNICAL ASSISTANCE, FINANCIAL AID. A BOOKLET FOR THE COMMUNITY LEADER.
1956, 19p

Descriptors: (*Water pollution, *Legislation), Law (Jurisprudence).

The first comprehensive-type legislation in the pollution control field was the Water Pollution Control Act of 1948. The particular concern of the Federal government in the growing national pollution problem resulted in the new Federal Water Pollution Control Act of 1956. Its provisions are presented and discussed.

PB-216 121
Vermont State Dept. of Health, Montpelier. Div. of Industrial Hygiene.
CONTROL OF SILICOSIS IN VERMONT GRANITE INDUSTRY.
Progress rept.,
Andrew D. Hosey, Victoria M. Trasko, Harry B. Ashe, Howard E. Ayer, and Morton Lippman. 1957, 81p PHS-Pub-557

Descriptors: (*Silicosis, *Quarrying), (*Air pollution, *Silicon dioxide), (*Vermont, Silicosis), Quartz, Industrial medicine, Granite.
Identifiers: *Air pollution effects (Animals).

The report presents the results of investigations and observations on progress made to date in the control of silicosis in the Vermont granite industry. The contents include: Vermont granite industry; Early studies of silicosis in Vermont granite industry; Developments in engineering control of granite dust; Present silicosis control program; Environmental study.

PB-216 122
IIT Research Inst., Chicago, Ill.
THE COST OF CLEAN WATER. VOLUME III. PLASTICS MATERIALS AND RESINS.
Industrial waste profiles.

12 Oct 67, 97p FWPCA-IWP-10
Contract DI-14-12-104

Descriptors: (*Plastics industry, *Industrial waste treatment), (*Water pollution, Plastics industry).
Identifiers: *Water pollution control.

This profile study of Standard Industrial Code (SIC) 28210 represents one segment of the total analysis of major contributors of water-borne pollution. The purposes of this profile study were (1) to identify, quantify and qualify processes and wastes, gross waste quantities, waste reduction practices, and waste reduction cost information, (2) to summarize these various facets of the waste picture, and (3) to make projections on future product growth. The major effort of the study involved the acquisition of first-hand organized information from the producers of plastics. Thus key production plants were visited, and the actual production facilities, in addition to the water renovation facilities, were physically surveyed.

PB-216 123
Robert S. Kerr Water Research Center, Ada, Okla.
INDUCED AERATION OF SMALL MOUNTAIN LAKES.
Water pollution control research series,
Lowell E. Leach, and Curtis C. Harlin, Jr. Nov 70, 58p EPA-WQO-16080-11/70
Paper copy available GPO $0.65 as EP1.16:16080-11/70.

Descriptors: (*Lakes, *Aeration), (*Stratification, Lakes), Nutrients, Oxygenation.
Identifiers: *Water pollution control, *Destratification.

Summer stratification in small mountain trout-fishery lakes restricts trout habitat to the thin layer of surface water. As atmospheric temperatures increase during later summer months, the epilimnion waters reach temperatures intolerable for trout. A technique of managing trout-fishery lakes, through introduction of compressed air, was studied at Lake Roberts in southern New Mexico during the summer of 1969. Research was conducted to determine the feasibility of induced aeration to control nutrient stratification and dissipation of high-bottom concentrations of hydrogen sulfide. The oxygenation efficiency of the induced aeration system was evaluated, and further research required for optimum development of the systems as management tools for trout-fishery lakes is discussed. (Author)

PB-216 124
Communicable Disease Center, Atlanta, Ga.
FLIES OF PUBLIC HEALTH IMPORTANCE AND THEIR CONTROL. TRAINING GUIDE,
Insect control series,
Harold George Scott, and Kent S. Littig. 1962, 44p PHS-Pub-772-ICS-5

Descriptors: (*Diptera, *Insect control).

The report discusses flies and their control. The topics covered include: Flies in relation to human welfare; General characteristics of flies; Identification and biology of flies; Fly survey techniques; Domestic fly control by environmental sanitation; Domestic fly control with chemicals; Mechanical and physical control of domestic flies; Biological control of domestic flies; and Organized fly control.

PB-216 125
Public Health Service, Washington, D.C. Office of Information and Publications.
PUBLIC HEALTH SERVICE NUMBERED PUBLICATIONS. A CATALOG: 1950-1962.
Bibliography Series.
Jun 64, 183p PHS-Pub-1112, PHS-BS-55

Descriptors: (*National government, *Technical reports).
Identifiers: *Public Health Service.

The catalog represents the major output of nonperiodical literature of the Public Health Service. It includes all the numbered publications of the Service from 1950 through 1962. The catalog is essentially a reference volume, and while representative, does not include all the published materials of the Public Health Service. Omitted are periodical publications, reprints, training materials, and publications issued in limited quantities. The catalog has four major sections. It begins with a NUMERICAL LISTING, which lists titles in numerical order by their PHS Publication Number. A TITLE LISTING, arranged in alphabetical order; a SERIES LISTING, identifying all publications which comprise special series within the over-all numbering system; and a SUBJECT INDEX.

PB-216 126
Public Health Service, Washington, D.C. Office of Information and Publications.
PUBLIC HEALTH SERVICE NUMBERED PUBLICATIONS 1963-1964, SUPPLEMENT NO. 1 TO A CATALOG 1950-1962.
Bibliography series.

May 65, 119p PHS-Pub-1112-Suppl-1, PHS-BS-55-Suppl-1
Supplement no. 1 to PB-216 125.

Descriptors: (*National government, *Periodicals).

The report is the first Supplement to PHS Publication No. 1112, 'Public Health Service Numbered Publications--A Catalog, 1950-1962' and contains those numbered publications issued during the period of 1963-1964. The Supplement has four major sections. These are: Numerical listings; Title listings; Series listings; and Subject index. (Author Modified Abstract)

PB-216 127
American Public Works Association, Chicago, Ill. Research Foundation.
WATER POLLUTION ASPECTS OF URBAN RUNOFF.
Final rept.
Jan 69, 270p WP-20-15
Contract FWPCA-WA-66-23
Report on the Causes and Remedies of Water Pollution from Surface Drainage of Urban Areas - Research Project No. 120.
Paper copy available from GPO $1.50 as 167.13/3:15.

Descriptors: (*Water pollution, *Surface water runoff), (*Urban areas, Surface water runoff), Storm water.
Identifiers: *Storm water runoff, *Urban hydrology, *Water pollution control.

A study was conducted to determine the factors in the urban environment which contribute to the pollution of urban storm water runoff and to determine methods to limit this source of water pollution. It was found that street refuse - litter - could be a significant factor when the nature of the shock discharge of the pollution is considered. An evaluation was made of the efficiency of street cleaning methods and limitations of commonly used equipment explored. Catch basins in conjunction with street inlets to the storm water disposal system were also determined to be a potential major source of pollution. Other potential sources of pollution considered included air pollution, roof discharges, and chemicals used in the urban environment. (Author Modified Abstract)

PB-216 128
Environmental Health Center, Cincinnati, Ohio.
STUDIES ON HOUSEHOLD SEWAGE DISPOSAL SYSTEMS, PART III,
T. W. Bendixen, M. Berk, J. P. Sheeby, and S. R. Weibel. 1950, 96p
Prepared in cooperation with Housing and Home Finance Agency.

Descriptors: (*Septic tanks, Performance evaluation).

The topics reported are: Septic Tank Compartmentation Studies; Experimental Studies of Tank Inlets, Outlets and Intercompartment Appurtenances; Field Studies of Possible Modifications of the Percolation Test Method; Examination of Field Survey Data Absorption Systems; Permeability Conditions in Operating Tile Fields; Soil Clogging Effects of Septic Tank Effluents.

PB-216 129
Communicable Disease Center, Atlanta, Ga.
HOUSEHOLD AND STORED-FOOD INSECTS OF PUBLIC HEALTH IMPORTANCE AND THEIR CONTROL. TRAINING GUIDE.
Insect Control Series,
Harold George Scott. May 63, 58p PHS-Pub-772-ICS-12

Descriptors: (*Insect control, *Public health), Food sanitation, Houses.

The report discusses the following aspects of household and stored insects: Public health importance; Identification of common household and stored-food pests; Survey for stored-food insects; Control of household insects; and Stored-food insects.

PB-216 131
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
MANUAL OF RECOMMENDED PRACTICE FOR SANITARY CONTROL OF THE SHELLFISH INDUSTRY. PART I: SANITATION OF SHELLFISH GROWING AREAS. REVISION,
Eugene T. Jensen. 1959, 38p PHS-Pub-33-Pt-1-Rev-59
Revision of report dated 1946.

Descriptors: (*Food sanitation, *Shellfish), (*Water pollution, Shellfish).

The report describes statuatory procedures to be followed by shellfish producing states, by the United States Public Health Service, and by the shellfish industry to assure proper sanitation control.

PB-216 133
National Communicable Disease Center, Atlanta, Ga.
LABORATORY PROCEDURES FOR THE DIAGNOSIS OF INTESTINAL PARASITES,
Dorothy M. Melvin, and Marion M. Brooke. 1969, 153p PHS-Pub-1969
Paper copy available from GPO $2.75 as stock no. FS2.60/7:IN8/2.

Descriptors: (*Parasitic diseases, *Intestines), (*Parasitology, *Medical laboratories), Tests, Serology, Diagnosis, Nematoda, Protozoa, Platyhelminthes, Manuals.
Identifiers: *Laboratory diagnosis.

The manual is concerned with direct laboratory procedures used in recovery and identification of intestinal parasites and related species (atrial, bladder, and lung parasites) and with the collection of satisfactory specimens. Competent laboratory work is dependent on several factors: 1) personnel trained in examining specimens and accurately identifying organisms, (2) adequate laboratory facilities, including a good microscope, and (3) satisfactory specimens. The primary purpose of this manual is to present selected methods which can be used routinely in laboratories performing parasitologic examinations and which, when performed properly, are reliable and thorough.

PB-216 135
Public Health Service, Washington, D.C. Div. of Air Pollution.
SULFUR OXIDES AND OTHER SULFUR COMPOUNDS. A BIBLIOGRAPHY WITH ABSTRACTS.
Bibliography series no. 56,
Anna Grossmann Cooper. 1965, 392p PHS-Pub-1093, PHS-BS-56

Descriptors: (*Air pollution, Sulfur oxides), (*Bibliographies, *Sulfur oxides), Sulfur inorganic compounds.
Identifiers: *Air pollution effects (Animals), *Air pollution effects (Plants), *Air pollution effects (Materials).

Although this annotated bibliography on sulfur oxides and other sulfur compounds includes publications from 1893 to 1964, it is by no means all-inclusive. The bibliography proper is arranged under 13 subjects. These are: Sources; Composition; Atmospheric reactions; Nature of atmospheres; Human epidemiology; Human exposure; Industrial exposures; Animal epidemiology; Animal exposure; Plant epidemiology and experimental exposure; Materials damage, visibility reduction; Control devices or methods and instrumentation development; and Selected publications.

PB-216 136
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
DRINKING WATER QUALITY OF SELECTED INTERSTATE CARRIER WATER SUPPLIES, 1960-1961.

Jun 63, 188p PHS-Pub-1049
Errata sheet and Addendum inserted.

Descriptors: (*Water supply, *Water quality), (*Water treatment, Water quality), (*Potable water, Water quality), Inventories.
Identifiers: *Water quality data.

The drinking water quality of 176 selected interstate carrier water supply sources is being determined in a joint program conducted in 1960-1963 by municipalities, State health departments and the Public Health Service. Samples of water are being analyzed for organic chemicals, radiochemicals and trace elements and other determinations generally classed as sanitary chemical analyses. Samples are composite over a two-week period and collected of finished water at points believed to be most representative of water consumed by residents of the community. The project consists of taking two series of samples, of which this publication gives data on the first.

PB-216 137
Wichita State Univ., Kansas. Dept. of Economics.
THE COST OF CLEAN WATER. VOLUME III. MEAT PRODUCTS. 1. MEAT PACKING. 2. POULTRY PROCESSING.
Industrial waste Profiles.

Sep 67, 148p FWPCA-IWP-8
Contract DI-14-12-103
Paper copy available from GPO $1.00 as I67.2:C82/Vol3/No8

Descriptors: (*Food processing, *Industrial waste treatment), (*Water pollution, Food processing).
Identifiers: *Poultry processing, *Meat packing, *Slaughtering house wastes, *Water pollution control.

The Industrial Waste Profiles were established to describe the source and quantity of pollutants produced by each of the ten industries studied. The profiles were designed to provide industry and government with information on the costs and alternatives involved in dealing effectively with the industrial water pollution problem. They include descriptions of the costs and effectiveness of alternative methods of reducing liquid wastes by changing processing methods, by intensifying use of various treatment methods, and by increasing utilization of wastes in by-products or water reuse in processing. They also describe past and projected changes in processing and treatment methods. This report is concerned with the meat packing and poultry processing industry.

PB-216 138
Consolidated Controls Copr., Bethel, Conn.
THERMIONIC TOPPING CONVERTER FOR A COAL-FIRED POWER PLANT.
Final rept.,
Anthony J. Cassano, and John R. Bedell. 1970, 114p CCC-60-6445-17
Contract DI-14-01-0001-499
Paper copy available from GPO $1.25 as I63.10:52.

Descriptors: (*Thermionic power generation, *Electric power plants), Thermal power plants, Coal, Design, Cost estimates.

A two-phase investigation was made into the feasibility and practicality of thermionic topping as applied to a coal-fired central power station. The work included a comparison analysis of a modern station to indicate the inherent advantages of thermionic topping and an experimental and materials effort to establish the guide lines for fabrication of the thermionic converters and selection of materials specifically required by the thermionic plant.

PB-216 139
Public Health Service, Washington, D.C.
LET'S CLEAR THE AIR.
1962, 11p PHS-Pub-1238

Descriptors: (*Air pollution, Reviews).

The pamphlet was originally a speech presented by Dr. Luther L. Terry, Surgeon General of the U.S. Public Health Service, at the National Conference on Air pollution in December 1962. IT SUMMARIZES THE PROBLEMS AND FUTURE CONTROL METHODS TO REDUCE AIR POLLUTION.

PB-216 140
Federal Water Pollution Control Administration, Cincinnati, Ohio. Ohio Basin Region.
A GUIDE TO REPORT WRITING (BIBLIOGRAPHIC REFERENCES).
Apr 70, 22p

Descriptors: (*Technical writing, *Bibliographies).

The guide is a ready reference for people who wish to express themselves clearly in writing. A bibliography is presented on the subject of report writing. (Author)

PB-216 141
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
WATER QUALITY INVESTIGATIONS, LAKE MICHIGAN BASIN. PHYSICAL AND CHEMICAL QUALITY CONDITIONS.
Technical rept.
Jan 68, 89p

Descriptors: (*Lake Michigan, *Water pollution), Wisconsin, Illinois, Indiana, Michigan.
Identifiers: *Water quality data.

The report presents the physical and chemical results of a comprehensive study of Lake Michigan waters conducted by the Great Lakes-Illinois River Basins Project from April 1962 to July 1964. The study was conducted through the collection of appropriate samples during a series of 20 cruises made on the Lake by laboratory-equipped vessels. The purpose of the study was to determine the present physical and chemical water quality and to describe those areas of the Lake which exhibited significant water quality degradation.

PB-216 142
American Public Works Association, Chicago, Ill.
COMBINED SEWER REGULATOR OVERFLOW FACILITIES.

Jul 70, 145p FWQA-11022-DMU-07/70
Contract DI-14-12-456
Paper copy available from GPO $1.50 as I6[illegible]3/4:11022DMU07/0.

Descriptors: (*Overflows, Flow regulators), (*Combined sewers, *Flow regulators).
Identifiers: *Water pollution control.

Current design, operation and maintenance practices used by local jurisdictions in the United States and Canada were determined by personal interviews and compiled. Particular attention was given to the performance of various types of regulators, the use of tide gates, new designs, European practices and the systems concept of combined sewer regulation. Thirty-seven drawings and photographs of regulators are included. Seventeen recommendations are made, the adoption of which would upgrade regulator facilities and tend to reduce receiving water pollution from combined sewer overflows. (Author Modified Abstract)

PB-216 143
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
MISSOURI-SOURIS DEVELOPMENT AREA WATER POLLUTION INVESTIGATION.
Water pollution series.

Nov 51, 265p PHS-Pub-177, PHS-WPS-32

Descriptors: (*Missouri River Basin, *Water pollution), (*Souris River Basin, *Water pollution), (*North Dakota, Water pollution), (*Minnesota, Water pollution), (*Montana, Water pollution), River basin development, Water resources.

The Missouri-Souris portion of the land and water resources development program for the Missouri River Basin calls for diversion of Missouri River water at strategic points for multipurpose use and to supplement available water in the Souris, Red, and James River Basins. The report covers the Missouri-Souris-Red area. A general section deals with over-all water supply and water pollution problems pertinent to the area and includes survey methods, review of State Water Pollution Control Law, conclusions and recommendations. The major sub-basins are discussed in detail in separate sections of the report. Pertinent detail infomation, laboratory and flow data, and other presentations are included as appendixes.

PB-216 144
Los Angeles County Air Pollution Control District, Calif.
EMISSIONS OF OXIDES OF NITROGEN FROM STATIONARY SOURCES IN LOS ANGELES COUNTY. REPORT NO. 2. OXIDES OF NITROGEN EMITTED BY SMALL SOURCES.
Sep 60, 86p

Descriptors: (*Nitrogen oxides, Air pollution), (*California, *Air pollution), Industrial wastes, Sources, Furnaces, Iron and steel industry, Boilers, Combustion products.
Identifiers: *Los Angeles (California).

The project objective was to determine the total weight of oxides of nitrogen emitted into the atmosphere each day from non-moving sources of air pollution. The report discusses the evaluation of data obtained from tests made on small sources such as: Domestic and commercial gas appliances; Metallurgical furnaces; Non-metallurgical furnaces and kilns; Chemical process equipment; General industrial equipment; and Air pollution control equipment.

PB-216 145
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
INTERSTATE ATMOSPHERIC TRANSPORT OF TRACER PARTICLES IN THE NEW YORK--NEW JERSEY METROPOLITAN AREA.
Technical rept.,
William H. Megonnell. Jan 58, 121p SEC-TR-A58-6

Descriptors: (*Air pollution, *New York), (*Air pollution, *New Jersey), (*Atmospheric motion, Air pollution).
Identifiers: *New York City Metropolitan Area.

The purpose of the project was to investigate the interstate transport of air pollutants in the New York-New Jersey area. Small amounts of an identifiable simulated atmospheric pollutant (fluorescent zinc cadmuim sulfide tracer material) were released in one State and recovered in the other. The interstate-transfer potential of air pollutants, in both directions, between the States of New Jersey and New York was clearly demonstrated. Dispersal patterns and flight paths of the tracer material were determined.

PB-216 146
Public Health Service, Washington, D.C. Bureau of State Services.
STATISTICAL SUMMARY OF SEWAGE WORKS IN THE UNITED STATES,
John R. Thoman, and Kenneth H. Jenkins. 1958, 43p PHS-Pub-609
See also PB-216 119.

Descriptors: (*Sewage treatment, *United States), Inventories.
Identifiers: *Sewage treatment plants.

The report summarizes and analyzes data on community sewage works in the United States based on the 1957 Inventory of Municipal and Industrial Wastes Facilities. Comprehensive data are presented by States, major drainage basins, and community size groups. (Author Modified Abstract)

PB-216 147
Public Health Service, Cincinnati, Ohio. Ohio-Tennessee Drainage Basins Office.
HANDBOOK OF SELECTED BIOLOGICAL REFERENCES ON WATER POLLUTION CONTROL, SEWAGE TREATMENT, AND WATER TREATMENT.
Bibliography Series,
William M. Ingram. 1953, 76p PHS-Pub-214, PHS-BS-8

Descriptors: (*Sewage treatment, Biology), (*Water treatment, Biology), (*Bibliographies, Biology).

These biological bibliographies may be found useful as pertinent references for those working in water pollution control, sewage treatment and water treatment. The bibliographies are by no means complete. The references in them were selected largely on their availability and for their potential usefulness to those not trained primarily in biology. These brief bibliographies can serve those in water pollution control programs, sewage treatment, and water treatment in unfolding information that may be basic to a good understanding of certain biological problems that could arise in the course of professional work. Marine waters are not considered.

PB-216 148
Public Health Service, Washington, D.C. Bureau of State Services.
HEALTH OF WORKERS IN CHROMATE PRODUCING INDUSTRY: A STUDY,
A. L. Koven, C. J. Buhrow, F. J. Walters, R. E. Bales, and C. D. Yaffe. 1953, 143p PHS-Pub-192

Descriptors: (*Carcinogens, Chromates), (*Occupational diseases, *Malignant neoplasms), (*Chromates, *Industrial medicine), (*Air pollution, Chromates), Industries, Bronchial neoplasms, Dusts, Eye diseases, Pulmonary fibrosis, Respiratory diseases, Mortality, Morbidity.
Identifiers: *Indoor air pollution, *Air pollution effects (Humans).

In recent years, suspicion has steadily increased of carcinogenic hazards in the chromate-producing industry. Although various theories have been advanced as to the causative agent believed to be responsible for bronchiogenic cancer in the industry, this agent has not been precisely identified. The results of the study constitute a contribution to knowledge in that they substantiate the existence of a cancer problem among chromate workers, help to identify the causative agents, and present methods of controlling the hazard.

PB-216 149
Public Health Service, Cincinnati, Ohio. Ohio-Tennessee Drainage Basins Office.
LAKE ERIE DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.

1951, 56p PHS-WPS-11, PHS-Pub-119

Descriptors: (*Lake Erie, *Water pollution).

This report on the Lake Erie Basin presents information about its use, the pollution going into the water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required.

PB-216 151
Food and Drug Administration, Washington, D.C.
POULTRY HYGIENE. PART 1. EXAMINATION AND EVALUATION OF POULTRY AND POULTRY PRODUCTS.
Aug 59, 62p FDA-Technical Bull-2 PHS-Pub-683
Errata sheet inserted.

Descriptors: (*Poultry, *Aminal diseases), (*Food inspection, Poultry), (*Food contamination, Poultry), Meat, Public health, Food consumption, Food sanitation, Infections, Microbiology, Parasitology, Histology, Pathology.

Contents:
- Modern concepts of meat hygiene;
- Principles of poultry inspection;
- 'Warm' evisceration;
- Disposal of unfit carcasses and parts;
- Significance of diseases and other conditions;
- Significance of specific ante-mortem and post-mortem findings.

PB-216 190
Public Health Service, Washington, D.C. Div. of Air Pollution.
AIR POLLUTION TRAINING PROGRAMS.
1966, 46p PHS-Pub-1542

Descriptors: (*Air pollution, *Education), (*Grants, Air pollution).

Contents: Graduate training programs supported by grants from the Division of Air Pollution (Conditions under which stipends are awarded; Participating universities); Graduate training programs or courses not supported by the Division of Air Pollution (City college of New York, Clemson University, Copper Union, Illinois Institute of Technology, University of North Carolina); Special fellowships offered by the Division of Air Pollution; Control specialists training programs supported by grants from the Division of Air Pollution (Universtiy of Southern California, Pennsylvania State University); and Air pollution courses offered by the Division of Air Pollution.

PB-216 191
California Univ., Berkeley. Coll. of Engineering.
SOLID WASTE MANAGEMENT: ABSTRACTS AND EXCERPTS FROM THE LITERATURE. VOLUMES 1 AND 2,
C. G. Golueke. 1970, 468p PHS-Pub-2038, EPA-SW-2RG-70
Grant PHS-EC-00260

Descriptors: (*Waste disposal, *Bibliographies), Abstracts.
Identifiers: *Solid waste disposal.

The report covering the literature search and data collecting activities carried on as a part of phases I and II of the major research effort Comprehensive Studies of Solid Wastes Management. The report is a collection of abstracts and excerpts of the literature reviewed up to 1968.

PB-216 192
Bureau of Solid Waste Management, Cincinnati, Ohio.
STUDY REPORT ON A PILOT-PLANT CONICAL INCINERATOR,
William C. Achinger. 1970, 61p BSWM-SW-14ts

Descriptors: (*Waste disposal, Incinerators), (*Incinertors, Design), Performance evaluation, Air pollution, Water pollution.
Identifiers: *Solid waste disposal.

The incinerator tested, a pilot plant designed to process 1,000 lb of solid waste per hr, incorporated upper and lower duct sprays, a water scrubber, an afterburner, and, an electrostatic precipitator. These air pollution control devices could be operated independently or, to a degree, in series. Approximately 13 tons of waste were processed through the conical burner at a rate of 1,430 lb/hr. After incineration, the total residue as sampled was approximately 6,800 lb with a heat content of 180 Btu/lb. Incinerator design and methods used to collect and analyze solid waste samples or residue are given.

PB-216 193
Federal Water Pollution Control Administration, Washington, D.C. Div. of Construction Grants.
SEWER AND SEWAGE TREATMENT PLANT CONSTRUCTION COST INDEX.

Dec 67, 65p CWT-1

Descriptors: (*Sewage treatment, *Construction costs), Cost estimates, Indexes (Ratios).
Identifiers: *Sewage treatment plants.

Construction costs for sewers and treatment plants have risen steadily since the mid 1930's. Rates of increase vary among the different construction elements such as labor, materials and equipment, as well as for different types of construction. Contract award data have proven useful for evaluating progress in the construction of sewers and treatment plants. During a period of rising costs, however, such data need to be adjusted to a standard base to assure comparability. This can be done through the use of an appropriate construction cost index. The report presents such an index.

PB-216 194
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY CONSERVATION ARKANSAS-RED RIVER BASINS. SUMMARY REPORT ON BASIC STUDY OF WATER QUALITY. SOURCES OF NATURAL AND MANMADE SALT POLLUTION, AND SUGGESTED CORRECTIVE MEASURES.

Mar 64, 75p

Descriptors: (*Arkansas River Basin, *Water pollution), (*Red River Basin, *Water pollution), (*Kansas, Water pollution), (*Oklahoma, Water pollution), (*Texas, Water pollution), Minerals, Inorganic salts.

Intensive study and investigation of mineral pollution and its causes, both natural and manmade, were carried out on the Arkansas and Red Rivers together with their tributaries in the middle third of the basins. The study covered water years 1961 and 1962. The investigations of benefits considered the impact of water quality improvement on municipal, industrial, and agricultural water uses. The evaluation was extended to include areas immediately adjacent to, and forming an integral part of economy of, the Arkansas-Red River basins. The evaluation extended through the year 2070, with emphasis on the 1970-2020 period. (Author)

PB-216 195
Public Health Service, Washington, D.C.
ENVIRONMENT AND HEALTH: PROBLEMS OF ENVIRONMENTAL HEALTH IN THE UNITED STATES AND THE PUBLIC HEALTH SERVICE PROGRAMS WHICH AID STATES AND COMMUNITIES IN THEIR EFFORTS TO SOLVE SUCH PROBLEMS.
1951, 156p

Descriptors: (*Public health, *Environmental surveys).

The report briefly looks at the overall effect of environmental conditions upon public health. Some of the topics presented include: Drinking water; Water pollution control; Air pollution control; Milk and food; Pest control; Health and safety at home; Refuse control; School and rural environments; Protection for travelers; Industrial health; Radiological health; The administrative task; and Basic and applied research.

PB-216 196
National Center for Urban and Industrial Health, Chevy Chase, Md. Solid Wastes Program.
REFUSE COLLECTION AND DISPOSAL. AN ANNOTATED BIBLIOGRAPHY, 1962-1963.
Bibliography series,
Ralph J. Black, John B. Wheeler, and William G. Henderson. 1966, 138p PHS-Pub-91-Suppl-F, PHS-BS-4-Suppl-F

Descriptors: (*Waste disposal, *Bibliographies), Regulations, Financing, Storage, Collection, Composts, Grinding (Comminution), Incinerators, Earth fills, Materials recovery, Streets, Cleaning.
Identifiers: *Solid waste disposal, Litter.

Contents: Regulations; Finances; Storage; Collection and disposal-general; Collection-equipment; Collection-general; Transfer and transportation of refuse; Disposal general; Composting and reduction; Garbage grinding; Incineration; Sanitary landfill; Salvaging; Radioactive wastes; Street cleaning; Litter.

PB-216 197
Public Health Service, Washington, D.C. Div. of Sanitation.
ORDINANCE AND CODE REGULATING EATING AND DRINKING ESTABLISHMENTS. 1943 RECOMMENDATIONS OF THE PUBLIC HEALTH SERVICE.

1950, 73p PHS-Pub-37
Reprint of PHS-Bull-280 dated 1948.

Descriptors: (*Food services, *Food sanitation), Regulations.

An ordinance and code regulating eating and drinking establishments is recommended by the United States Public Health Service for adoption by States, municipalities, counties, and health districts in order to encourage a greater uniformity and a higher level of excellence in the sanitary control of eating and drinking establishments. The ordinance and code embodies the latest information at present available on legislation relating to the public health supervision of eating and drinking establishments but should be considered subject to change as improvements are developed.

PB-216 198
Public Health Service, Washington, D.C.
NATIONAL GOALS IN AIR POLLUTION RESEARCH.
Aug 60, 41p PHS-Pub-804
Report of the Surgeon General's Ad Hoc Task Group on Air Pollution Research Goals.

Descriptors: (*Air pollution, *Project planning), Research management, Cost estimates, Trends, National government.

Contents:
Air pollution problems;
Air pollution trends;
Specific Goals in Air Pollution Research;
Inter-Relationships of the goals.

PB-216 199
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
NATIONAL SHELLFISH SANITATION PROGRAM MANUAL OF OPERATIONS. PART III. PUBLIC HEALTH SERVICE APPRAISAL OF STATE SHELLFISH SANITATION PROGRAMS.
1965, 25p PHS-Pub-33

Descriptors: (*Food sanitation, *Shellfish), Manuals.

Contents:
Exercise of public health responsibilities in the national shellfish sanitation program;
Appraisal procedure;
Preparation of rating officer's report;
Supplemental program statistics;
Appendices – PHS-FDA Agreement;
DHEW-Department of Interior Agreement;
Form X Combined Summary Rating.

PB-216 200
Public Health Service, San Francisco, Calif. California and Great Basin Drainage Basins Office.
GREAT BASIN DRAINAGE BASIN.
Water pollution series.
1951, 76P PHS-Pub-82, PHS-WPS-4
Prepared in cooperation with California State Dept. of Public Health, Sacramento, Idaho Dept. of Public Health, Boise, Nevada State Dept. of Health, Reno, Utah State Dept. of Health, Salt Lake City, and Wyoming State Dept. of Health, Cheyenne.

Descriptors: (*United States, *Water resources), (*Utah, Water pollution), (*Nevada, *Water pollution), (*California, *Water pollution).

Contents: Uses of water resources; Pollution contributed to water resources; Damages to water resources from pollution; Benefits resulting from pollution prevention and abatement; Pollution prevention measures in effect; Pollution prevention measures required.

PB-216 201
Public Health Service, Washington, D.C. Div. of Air Pollution.
GUIDE TO RESEARCH IN AIR POLLUTION. PROJECTS ACTIVE IN CALENDAR YEAR 1962.
1962, 85p PHS-Pub-981

Descriptors: (*Air pollution, *Research).

The Guide is divided into four sections, the first summarizing the status of air pollution research as a whole, the second listing individual projects under investigation during 1962, and the third and fourth sections providing indexes to these projects by subject and by investigator. The introductory information of each section explains the arrangement of information presented therein. (Author)

PB-216 203
Public Health Service, Washington, D.C. Bureau of State Services.
THE VENDING OF FOODS AND BEVERAGES: A SANITATION ORDINANCE AND CODE - 1957 RECOMMENDATIONS OF THE PUBLIC HEALTH SERVICE.
19 Jul 57, 24p PHS-Pub-546
Errata sheet inserted.

Descriptors: (*Vendors, *Food sanitation), (*Food dispensing, Food sanitation), Regulations.

The report concerns vending foods and beverages. It presents a copy of an Adoption-by-Reference Form, Sanitation Ordinance and Code Covering the Vending of Foods and Beverages as well as a Sanitation Ordinance and Code Covering the Vending of Foods and Beverages (Unabridged Form).

PB-216 204
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
HANDBOOK ON SANITATION OF RAILROAD PASSENGER CAR CONSTRUCTION. STANDARDS OF SANITATION APPLICABLE TO THE CONSTRUCTION OF RAILROAD PASSENGER AND DINING CARS.
1957, 21p PHS-Pub-95

Descriptors: (*Railroad cars, *Sanitary engineering), Regulations, Handbooks, Standards.

The handbook has been prepared as one of a set of three handbooks related to railroad sanitation. The principles, or standards, of sanitation appearing in this handbook are intended to serve as a guide to those persons charged with the responsibility of incorporating provisions for sanitary equipment in the design or construction of railroad passenger cars and the reconstruction of existing cars. (Author Modified Abstract)

PB-216 205
Public Health Service, Washington, D.C.
PROCEEDINGS OF THE NATIONAL CONFERENCE ON AIR POLLUTION HELD IN WASHINGTON, D.C. ON NOVEMBER 18-20, 1958.
1959, 524p PHS-Pub-654

Descriptors: (*Air pollution, *Meetings).

Contents: Extent of air pollution; Sources of air pollution; Health effects of air pollution; Economic and social effects of air pollution; Air pollution control methods and procedures; and Administrative aspects of air pollution.

PB-216 206
Florida Univ., Gainsville. Engineering and Industrial Experiment Station.
REGISTER OF AIR POLLUTION ANALYSES. VOLUME 2.
Rept. for 1 Jan 56-30 Jun 59,
H. D. Townsend, and E. R. Hendrickson. 1961, 269p
Contract SAph-73387

Descriptors: (*Air pollution, *United States), Tables (Data).
Identifiers: *Air quality data.

Presented is a record of community air sampling and analyses performed in the United States and Territories during the period January 1, 1956 to June 30, 1959. (Author)

PB-216 207
Public Health Service, Washington, D.C. Bureau of State Services.
1957 INVENTORY MUNICIPAL AND INDUSTRIAL WASTE FACILITIES. VOLUME 1. REGION I - CONNECTICUT, MAINE, MASSACHUSETTS, NEW HAMPSHIRE, RHODE ISLAND, VERMONT.

1958, 133p PHS-Pub-622-Vol-1

Descriptors: (*Connecticut, *Water pollution), (*Maine, *Water pollution), (*Massachusetts, *Water pollution), (*New Hampshire, *Water pollution), (*Rhode Island, *Water pollution), (*Vermont, *Water pollution), Sources, Sewage, Industrial wastes.

The inventory contains the latest available data for all sources of pollution, both municipal and industrial, which are of significance in water pollution control programs. In the listings, each non-community entry is referred to the nearest community, whenever possible. Following the listing for each State there is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-216 208
National Center for Urban and Industrial Health, Cincinnati, Ohio.
REFUSE COLLECTION AND DISPOSAL. AN ANNOTATED BIBLIOGRAPHY 1960-1961.
Bibliography series no. 4,
Ralph J. Black, and Peter L. Davis. Dec 66, 75p
PHS-Pub-91-Suppl-E, PHS-BS-4-Suppl-E
Revision of report dated 1963.

Descriptors: (*Waste disposal, *Bibliographies).
Identifiers: *Solid waste disposal.

The bibliography covers the period 1960-61, and is arranged in sections which correspond to the various administrative and operational phases of the broad field of refuse handling. The references are annotated, periodical and other publications cited are listed, and an author index is provided for increased usability. In addition, a place index is provided as a further aid in locating specific information.

PB-216 209
National Center for Urban and Industrial Health, Cincinnati, Ohio.
WATER PHENOLS NO. 1.
Environmental health series,
Earl F. McFarren, John M. Matthews, and Raymond J. Lishka. 1967, 55p PHS-Pub-999-WP-43, PHS-ARS-Study-28

Report of a study conducted by the Analytical Reference Service.

Descriptors: (*Water analysis, *Phenols), (*Water pollution, Phenols), Standards, Accuracy.
Identifiers: *Water pollution detection, *Phenol/dichloro.

The objective of the study was to evaluate the ability of methods to quantitatively measure a low concentration of a mixture of phenols. The study consisted of four concentrated solutions shipped in sealed glass ampoules to various laboratories. The participants were instructed on receipt to dilute 5 ml of each sample to 1 liter with a good quality (phenol free) distilled water, and were informed that the samples would then contain concentrations of phenol and 2,4-dichlorophenol in the range of 1.0 to 200 microgram per liter. The distillation and chloroform extraction (of the final color) method will measure the phenol content of a sample very accurately and precisely, but it is not as sensitive as is desired. On the other hand the simplified aminoantipyrine method will measure neither phenol nor 2,4-dichlorophenol very accurately or precisely.

PB-216 210
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
AN INDUSTRIAL WASTE GUIDE TO THE CANE SUGAR INDUSTRY.

1959, 24p
Prepared in cooperation with American Sugar Cane League and National Technical Task Committee on Industrial Wastes.

Descriptors: (*Food processing, *Industrial waste treatment), (*Sugarcane, Food processing).
Identifiers: *Cane sugar industry, *Water pollution control.

In the Cane Sugar Industry, as in many other industries, control and disposal of wastes is of major concern. There are two important reasons for increased attention to these problems: First, the greatest possible recovery, use, and reduction of wastes is necessary for most economical production in small as well as in large plants. Second, protecting the Nation's limited water resources for maximum use is essential to our health and continued economic growth. Stream pollution control is mutually beneficial to industry, the individual citizen, and the Nation as a whole. Thus, wastes which cannot be eliminated must be disposed of in a manner which will not impair the usefulness of stream waters for other beneficial purposes. The Industrial Waste Guide to the Cane Sugar Industry is intended primarily to assist the operators and managers of cane sugar factories to utilize, reduce, and otherwise suitably dispose of waste waters. (Author)

PB-216 211
Public Health Service, Washington, D.C.
HIGHLIGHTS NATIONAL CONFERENCE ON AIR POLLUTION, 1958.

1959, 47p PHS-Pub-648

Descriptors: (*Air pollution, *Meetings).

The complete text of the conclusions and recommendations of the six discussion groups which were presented to the National Conference on Air Pollution is included in this report.

PB-216 212
Public Health Service, Washington, D.C. Div. of Air Pollution.
TODAY AND TOMORROW IN AIR POLLUTION: THE PROBLEM ITSELF AND OUR CONCEPTION OF IT ARE CHANGING.
1973, 31p

Descriptors: (*Air pollution, *Trends), Forecasting.

The report discusses the future levels of various air pollutants, their sources, and ways to control their increase.

PB-216 213
Public Health Service, Cincinnati, Ohio. Water and Sanitation Investigations.
A STUDY OF THE EFFECT OF SEWAGE DISTRIBUTION ON HIGH RATE FILTER EFFICIENCY,
W. Q. Kehr, C. C. Ruchhoft, and W. Scott Johnson. Dec 47, 44p

Descriptors: (*Sewage treatment, *Trickling filtration).
Identifiers: *Neosho sewage treatment plant.

A study was made of the effect of sewage distribution on the efficiency of high rate sewage filters at Neosho, Missouri. The Neosho municipal sewage treatment plant has two parallel, high-rate filters of the Aerofilter type and was designed for a population of 12,000 and a population equivalent of 22,500, the industrial wastes consisting principally of the wastes from a large milk condensery. The first period of study extended from March 19 to April 11, 1945, and the second from July 12 to August 8. Twenty 24-hour composite and five 4-hour composite samples were collected and analyzed from each sampling point during the first period and twenty-four 24-hour composite and two 4-hour composite samples during the second. In addition, grab samples were collected for analysis during both periods for dissolved oxygen, B.O.D. of the digester supernatant, and special determinations.

PB-216 214
Robert A. Taft Sanitary Engineering Center. Cincinnati, Ohio.
PUBLIC HEALTH PROBLEMS IN CIVIL DEFENSE. METHODS FOR THE DETECTION AND IDENTIFICATION OF CHEMICAL WARFARE AGENTS IN AQUEOUS CARRIERS,
Lawrence J. Kamphake, and Paul W. Kabler. Jan 57, 35p PHS-Pub-529

Descriptors: (*Military chemical agents, *Water analysis), (*Colorimetric analysis, Military chemical agents).
Identifiers: *Water pollution detection, *Chemical agent detection.

Among the chemical warfare agents that might be encountered in civil defense are sarin, tabun, and soman (G-agents); sulfur and nitrogen mustards; arsenicals, cyanides, and fluoro-organic compounds. In this discussion six rapid colorimetric tests are recommended for the quantitative determination of these agents in water. The tests are adaptable to both laboratory and field conditions. A general review is presented of methods for the detection and quantitative determination of certain chemical warfare agents which might be encountered in civil defense. (Author Modified Abstract)

PB-216 215
Public Health Service, Washington, D.C. Div. of Air Pollution.
STATE AND LOCAL PROGRAMS IN AIR POLLUTION CONTROL.

1966, 18p PHS-Pub-1549
Paper copy available from GPO $0.25 as FS2.98:P94/2.

Descriptors: (*Air pollution, *Government policies), State government, Local government.

The study describes efforts and accomplishments completed during 1966 to develop state, regional, and local air pollution control programs. As authorized by the Clean Air Act of 1963, the report describes Federal program grants, State programs, budgets, and statistical surveys of programs.

PB-216 216
Stanford Univ., Calif. Dept. of Civil Engineering.
THE INFLUENCE OF CAPILLARITY ON THE FLOW OF WATER AND AIR IN A POROUS MEDIUM.
Technical rept.,
Donald Dean Adrian. Jun 64, 170p TR-38
Grant PHS-WP-00246

Descriptors: (*Hydrogeology, Gas flow), (*Ground water recharge, Gas flow), Compression, Mathematical models, Theses.

In the usual analysis of the flow of water into a porous medium, such as infiltration into a soil, air resistance is neglected. Obviously as water moves into the air-filled pores air must be driven out. In most cases the air flows with a negligible resistance compared to the resistance of water to flow. However, if the air escape route deeper into the medium is blocked by an impermeable barrier, the air will be trapped and its pressure will increase as the combined action of gravity and capillary forces try to force the air from the pores. This air pressure build-up will decrease the infiltration rate below the rate predicted from measurements of the permeability of the medium and its capillary characteristics. The report presents a mathematical analysis of this effect.

PB-216 217
Public Health Service, Washington, D.C. Div. of Dental Health.
NATURAL FLUORIDE CONTENT OF COMMUNAL WATER SUPPLIES IN THE UNITED STATES.
1959, 127p PHS-Pub-655

Descriptors: (*Water supply, *Fluorides), (*Water quality, Fluorides), Tables (Data).
Identifiers: *Water quality data.

A census of community water sources which contain fluoride naturally was made by the Dental Directors of all State health agencies during late 1956 and early 1957 at the request of the United States Public Health Service. These data, compiled for the total United States, arranged into tabulations and listings, are presented. They furnish reference material for use by individuals and agencies interested in detailed information about drinking water sources in each of the States, as well as in specific communities. (Author)

PB-216 218
Federal Water Pollution Control Administration, Cincinnati, Ohio. Technical Advisory and Investigations Branch.
A REPORT ON POLLUTION OF THE UPPER COLORADO RIVER BASIN TECHNICAL APPENDIX.

Apr 69, 98p PR-17
See also PB-216 945.

Descriptors: (*Colorado River, *Water pollution), (*Arizona, Water pollution), (*Utah, Water pollution), (*Colorado, Water pollution), (*Wyoming, Water pollution), (*New Mexico, Water pollution), Tables (Data).
Identifiers: *Water quality data.

The report includes all of the physical, chemical and bacteriological data determined from analyses on samples collected during the Technical Advisory and Investigations Branch, of the Federal Water Pollution Control Administration study of the Upper Colorado River during July and August, 1966.

PB-216 219
Public Health Service, San Francisco, Calif. California and Great Basin Drainage Basins Office.
REPORT ON WATER POLLUTION CONTROL - SAN DIEGO BASIN CALIFORNIA DRAINAGE BASIN.
Water pollution series.

1951, 135P PHS-Pub-169, PHS-WPS-30
Prepared in cooperation with California State Water Pollution Control Board, Sacramento, and San Diego Regional Water Pollution Control Board, San Diego, Calif.

Descriptors: (*San Diego River Basins, *Water pollution), (*California, Water pollution).

The report presents information about the ways the water resources of the area are used, the pollution entering those water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, pollution prevention measures now in effect, and those which appear to be needed. (Author)

PB-216 220
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY MUNICIPAL AND INDUSTRIAL WASTE FACILITIES, 1957. VOLUME 7. REGION VII. ARKANSAS, LOUISIANA, NEW MEXICO, OKLAHOMA, TEXAS.
1958, 182p PHS-Pub-622-Vol-7

Descriptors: (*Water pollution, *Arkansas), (*Water pollution, *Louisiana), (*Water pollution, *New Mexico), (*Water pollution, *Oklahoma), (*Water pollution, *Texas), Inventories, Sources, Sewage, Industrial wastes.

The inventory contains the latest available data for all sources of pollution, both municipal and industrial, which are of significance in water pollution control programs in Region VII.

PB-216 221
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
MUNICIPAL AND INDUSTRIAL WASTE FACILITIES - 1957 INVENTORY. VOLUME 2. REGION II - DELAWARE, NEW JERSEY, NEW YORK, PENNSYLVANIA. A COOPERATIVE STATE-FEDERAL REPT.
1958, 364p PHS-Pub-622-Vol-2

Descriptors: (*Sewage treatment, Inventories), (*Delaware, Sewage treatment), (*New Jersey, Sewage treatment), (*New York, Sewage treatment), (*Pennsylvania, Sewage treatment), (*Industrial waste treatment, Inventories).
Identifiers: *Sewage treatment plants.

Fundamental to effective programs of pollution prevention and abatement is knowledge of what facilities are available to control pollution, what these facilities are accomplishing, and what more needs to be done. The 1957 inventory contains such data, together with some information on industrial wastes.

PB-216 222
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY MUNICIPAL AND INDUSTRIAL WASTE FACILITIES, 1957. VOLUME 8. REGION VIII. COLORADO, IDAHO, MONTANA, UTAH, WYOMING.

1958, 113p PHS-Pub-622-Vol-8

Descriptors: (*Colorado, *Water pollution), (*Water pollution, *Idaho), (*Water pollution, *Montana), (*Water pollution, *Utah), (*Water pollution, *Wyoming), Inventories, Sources, Sewage, Industrial wastes.

The inventory contains the latest available data for all sources of pollution, both municipal and industrial, which are of significance in water pollution control programs in Region VIII.

PB-216 223
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
UTILIZATION OF THE MILK ORDINANCE AND CODE RECOMMENDED BY THE U.S. PUBLIC HEALTH SERVICE.
Jan 63, 31p PHS-Pub-1018

Descriptors: (*Milk, *Food sanitation), (*Regulations, Food sanitation).

The States and their political subdivisions which have utilized the Public Health Service Milk Ordinance and Code as the basis of their milk sanitation law or regulations, and the number of county and municipal adoptions by States, are shown in both tabular and chart form. Also presented are the following: A chronological summary of adoptions of milk sanitation laws or regulations based on the milk ordinance and code recommended by the Public Health Service; A geographical summary of adoptions of milk sanitation laws or regulations based on the milk ordinance and code recommended by the Public Health Service; List of American communities in which the milk ordinance recommended by the Public Health Service is in effect; and A list of states, counties, and municipalities in the United States which require compulsory pasteurization of market milk.

PB-216 224
Public Health Service, Washington, D.C.
THE WATER POLLUTION CONTROL PROGRAM OF THE U.S. PUBLIC HEALTH SERVICE. 1957-1958.
1958, 30p PHS-Pub-631

Descriptors: (*Water pollution, Government policies), National government.

The report gives a summary of the history and policies on federal, state, and local levels of the water pollution control programs, including the National Water Quality Sampling Networks of the United States.

PB-216 225
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY MUNICIPAL AND INDUSTRIAL WASTE FACILITIES, 1957. VOLUME 3. REGION III. DISTRICT OF COLUMBIA, KENTUCKY, MARYLAND, NORTH CAROLINA, VIRGINIA, WEST VIRGINIA.
1958, 199p PHS-Pub-622-Vol-3

Descriptors: (*Water pollution, *District of Columbia), (*Water pollution, *Kentucky), (*Water pollution, *Maryland), (*Water pollution, *North Carolina), (*Water pollution, *Virginia), (*Water pollution, *West Virginia), Inventories, Sources, Sewage, Industrial wastes.

The inventory contains the latest available data for all sources of pollution, both municipal and industrial, which are of significance in water pollution control programs in Region III.

PB-216 226
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY CONSERVATION ARKANSAS-RED RIVER BASINS APPENDIX. VOLUME II. WATER QUALITY DATA. PART I: MONTHLY SUMMARY OF CONTINUOUS RECORDED FLOW AND QUALITY DATA CHEMICAL ANALYSES OF NATURAL BRINE SOURCES .
Mar 64, 241p

Descriptors: (*Arkansas River Basin, *Water pollution), (*Red River Basin, *Water pollution), (*Colorado, Water pollution), (*Kansas, Water pollution), (*Oklahoma, Water pollution), (*Arkansas, Water pollution), (*Louisiana, Water pollution).
Identifiers: *Water quality data.

The compilation of water quality data collected during the 27-month period of intensive study (July 1960 through September 1962) of the Arkansas-Red River Basins Water Quality Conservation Project is presented in five parts. These data were gathered to provide a basis for (1) location and definition of the significant natural and manmade sources of slat (mineral) pollution, and (2) determination of the effects of these sources on the quality of water in the receiving streams. The intensive investigation of water quality and natural sources of mineral pollution was limited to the central portions of both basins, the area in which major salt sources exist, and mineral pollution is most severe. Stream quality monitoring consisted of continuous specific conductance recording combined with continuous flow measurement. Weekly grab samples were collected and analyzed to provide a basis for correlation of specific conductance with dissolved solids, chlorides, and sulfate concentration. In addition, samples were collected for trace elements and radioactivity analyses. (Author Modified Abstract)

PB-216 227
Glenwood Waste Treatment Plant, Minn.
GLENWOOD MINNESOTA WASTE TREATMENT PLANT OPERATING REPORT.

Nov 68, 6p
See also PB-217 899.

Descriptors: (*Sewage treatment, Minnesota).
Identifiers: *Glenwood (Minnesota).

The report consists of two tables which give the chemical composition of the sewage in the Glenwood, Minnesota sewage plant.

PB-216 228
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
WATER QUALITY EVALUATION OF THE BLUESTONE PROJECT, COLORADO.

Dec 69, 23p

Descriptors: (*Colorado, *Reservoirs), Water resources, Water quality.
Identifiers: *Mount Logan Reservoir, Garfield County (Colorado), Mesa County (Colorado).

The water quality evaluation has been prepared for the Bureau of Reclamation, Region 4, U. S. Department of the Interior, Salt Lake City, Utah, for inclusion in their feasibility report for the Bluestone Reservoir Project, Colorado. The primary purposes of this evaluation are: To determine the need for and value of separable reservoir storage for streamflow regulation to control water quality; To assess the overall impact of the proposed development on water quality, both in and outside the Project area; and To recommend, where applicable, water quality control measures for the project. (Author Modified Abstract)

PB-216 229
Public Health Service, Washington, D.C. Div. of Sanitation.
INSTRUCTOR'S GUIDE -- SANITARY FOOD SERVICE,
Herman F. Weigel, and James Lieberman. 1952,
233p PHS-Pub-90
Also issued as NAVMED P-1333 by the Department of the Navy, and as AFM-146-7 by the Department of the Air Force.
Paper copy available from GPO $1.50 as HE.20.1108:F73.

Descriptors: (*Food sanitation, *Food services).

The guide is designed for use in training food-service personnel in the principles and application of safe food service.

PB-216 230
Ohio Univ., Athens.
OPERATIONAL DEMONSTRATION OF OXIDATION DITCH METHOD OF WASTE TREATMENT.
Progress rept. 1 May 67-30 Apr 68,
Harry M. Kaneshige. 21 May 68, 108p
Grant WPD-100-02-67

Descriptors: (*Sewage treatment, *Lagoons (Ponds)), Channels (Waterways).
Identifiers: *Aeration ponds.

A statistical optimization method was developed for the systems analysis of the project on a sewage treatment effluent oxidation ditch. The results of the analysis are presented as three separate papers in the Appendix. Chlorination studies on batch samples in the laboratory were made. Biochemical oxygen demand reaction rate constants of 0.131 per day for raw wastewater and 0.078 per day for final effluent were obtained. Samples of raw wastewater, final effluent, mixed liquor, return sludge, and stream water were routinely analyzed two or three times weekly. Averages and ranges of values for the various laboratory analyses are presented. (Author)

PB-216 231
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
GRADE 'A' PASTEURIZED MILK ORDINANCE. 1965 RECOMMENDATIONS OF THE UNITED STATES PUBLIC HEALTH SERVICE.

1965, 205p PHS-Pub-229

Descriptors: (*Milk, *Food sanitation), (*Regulations, Milk).

The following Pasteurized Milk Ordinance, with Appendixes, is recommended for legal adoption by States, counties, and municipalities, in order to encourage a greater uniformity and a higher level of excellence of milk sanitation practice in the United States. An important purpose of this recommended standard is to facilitate the shipment and acceptance of milk and milk products of high sanitary quality in interstate and intrastate commerce. This edition of the Ordinance contains sanitary standards for Grade A pasteurized milk and milk products only. (Author)

PB-216 232
Federal Water Pollution Control Administration, Washington, D.C.
THE ECONOMICS OF CLEAN WATER. VOLUME 3. INORGANIC CHEMICALS INDUSTRY PROFILE.
Mar 70, 482p
Contract DI-14-12-592
Paper copy available from GPO $3.50 as I67.1/2:970/v3.

Descriptors: (*Industrial waste treatment, *Economic analysis), (*Chemical industry, Industrial waste treatment), Cost estimates, Manpower, Requirements.
Identifiers: *Water pollution economics.

The primary objective of the study was to acquire data and develop cost estimates on the waste treatment practices of selected industrial categories within the inorganic chemicals industry over the 1970 to 1974 period, and to develop manpower planning criteria for each of the waste treatment practices identified. A secondary objective of the study was to further test and refine as necessary the generalized methodology for establishing and projecting industry costs which was developed in the course of work 'Projected Wastewater Treatment Costs in the Organic Chemicals Industry.' A generalized framework for analyzing waste treat-

ment practices has been provided. (Author Modified Abstract)

PB-216 233
North Texas State Univ., Denton.
EFFECTS OF IMPOUNDMENTS ON WATER QUALITY IN THE SOUTHWEST. DISCUSSION - BACTERIAL CYCLES AND WATER QUALITY.
Report for period 1 Dec 66-31 Aug 69,
Rufus K. Guthrie. 31 Aug 69, 58p
Grant WPD-146-01
Includes reprint, Bacterial Cycles and Water Quality, published in Southwest Water Works Jnl., v 50 p 54-56 Oct 68.

Descriptors: (*Reservoirs, *Bacteria), (*Water pollution, Bacteria), Seasonal variations.

In the determination of bacterial counts for the detection of cycles of presence in a large body of water, one must take into account several sources of error, such as a period of heavy rainfall, producing extensive runoff into the water impoundment. A study on bacterial presence in one water impoundment for a period of 1 1/2 years indicated that this influx of bacterial population does not alter the overall pattern of cycles which may be present.

PB-216 234
Greenleaf/Telesca, Miami, Fla.
SOLID WASTE MANAGEMENT IN RESIDENTIAL COMPLEXES.
1971, 419p BSWM-SW-35c
Contract CPE-70-136
Paper copy available from GPO $3.00 as stock no. 5502-0060, and EP1.17:35C.

Descriptors: (*Residential buildings, *Refuse disposal), (*Waste disposal, Residential buildings), Collecting methods.
Identifiers: *Operation Breakthrough, *Solid waste disposal.

Studies and investigations were made for the purpose of determining alternative solid waste systems for those residential complexes in HUD's Operation Breakthrough Program, and recommending those conventional or innovative systems compatible with each site. The report identifies the basic solid waste system components and functions required in residential complexes and illustrates methods of evaluation of the different types of systems. It explores in some detail the types of hardware being marketed, or in the developing stage, from which these systems can be constructed. (Author Modified Abstract)

PB-216 235
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION MEASUREMENTS OF THE NATIONAL AIR SAMPLING NETWORK. ANALYSIS OF SUSPENDED PARTICULATE SAMPLES COLLECTED 1953-1957.

1958, 263p

Descriptors: (*Air pollution, *Particles), (*United States, Air pollution), Tables (Data).
Identifiers: *Air quality data.

The report covers the first five years of operation of the U.S. Public Health Service's National Air Sampling Network. It has been designed to present basic data on suspended particulate matter in the air over the United States. Much of its content consists of tables which present this information. The various text sections reflect the second purpose of this report: to provide the technical information necessary for the establishment of similar or identical sampling stations in community, area, or State Networks throughout the United States by appropriate agencies. For this reason, data concerning the statistical and chemical procedures used in the Network have been presented in greater detail than probably would have been necessary for an evaluation of the results.

PB-216 236
Envirotech Corp., Brisbane, Calif.
ADVANCES IN INCINERATION AND RESOURCE RECLAMATION,
F. P. Sebastian, and M. C. Isheim. 1970, 2p
Pub. in Proceedings of National Incinerator Conference (1970), Cincinnati, Ohio, May 70.

Descriptors: (*Sludge disposal, *Combustion), Incinerators.

The report describes the important role played by incineration and high temperature processing in the intensive waste water purification process carried out at the municipal sewage treatment plant at South Lake Tahoe. An increasing role for incineration is seen in the future for both conventional treatment and for advanced methods of waste treatment. (Author Modified Abstract)

PB-216 237
Sonoma County Sanitation Dept., Calif.
EVALUATION OF EXTERNAL SEALING METHOD TO REDUCE STORM FLOW EFFECTS IN SEWERAGE SYSTEMS. APPENDIX.
Final progress rept.,
Donald B. Head. 1966, 404p
Grant WPD-111-01-66
See also PB-215 495.

Descriptors: (*Sewers, *Sealing), (*Fluid infiltration, Sewers), (*Overflows, Fluid infiltration), Field tests, Patents.
Identifiers: *Storm water runoff.

The report presents data on field tests conducted to test the effectiveness of various sealants in preventing sewers from leaking.

PB-216 238
Halliburton Co., Duncan, Okla.
FEASIBILITY STUDY ON THE APPLICATION OF VARIOUS GROUTING AGENTS, TECHNIQUES AND METHODS TO THE ABATEMENT OF MINE DRAINAGE POLLUTION. PART II. SELECTION AND RECOMMENDATION OF TWENTY MINE SITES.

23 Aug 67, 299p
Contract DI-14-12-31
Report on Monongahela River Mine Drainage Remedial Project, Upper West Fork River Subbasin, W. Va. See also Part IV, PB-216 249.

Descriptors: (*Coal mines, *Sealing), (*Water pollution, Mine water), Grouting.
Identifiers: *Mine acid drainage.

The study involved a survey of all drift mine openings in the Upper West Fork River Sub-basin and the development of alternate remedial methods for the abatement of mine drainage pollution. Twenty mine sites were selected from the two hundred twenty-eight mines surveyed in the initial phase. These twenty sites are described in detail herein.

PB-216 239
Public Health Service, Washington, D.C. Div. of Air Pollution.
A DIGEST OF STATE AIR POLLUTION LAWS (1963 EDITION),
Samuel M. Rogers, Sidney Edelman, Donald J. Davidoff, William F. Johnson, and Gibbs Kinderman. 1963, 216p PHS-Pub-711
See also 1967 Edition, PB-197 064.

Descriptors: (*Air pollution, *Legislation), (*State government, Air pollution), Regulations, Law (Jurisprudence), Government policies.

The digest presents in summary form the essential elements of State air pollution control laws to assist in the consideration of State air pollution control legislation, both existing and proposed. It was prepared with the assistance of the Office of the General Counsel, U.S. Department of Health, Education, and Welfare, from an examination of State statutes enacted through the 1963 legislative session. Also included is an introductory section entitled, 'Guiding Principles -- State Air Pollution Legislation.' It deals with the essential elements of air pollution control statutes and should help those charged with the responsibility of preparing new or revised legislation in this area. (Author)

PB-216 240
National Center for Urban and Industrial Health, Cincinnati, Ohio.
MANUAL OF SEPTIC-TANK PRACTICE.
1967, 101p PHS-Pub-526
Prepared in cooperation with the Joint Committee on Rural Sanitation. Revision of report dated 1957 and reprinted 1963.

Descriptors: (*Septic tanks, Reviews), Design, Handbooks.

Contents:
Septic tank - soil absorption systems for private residences;
Septic tank - soil absorption systems for institutions, recreational areas, and other establishments.

PB-216 241
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
THE VENDING OF FOOD AND BEVERAGES. A SANITATION ORDINANCE AND CODE. 1965 RECOMMENDATIONS OF THE PUBLIC HEALTH SERVICE.
1965, 25p PHS-Pub-546-Rev-65

Descriptors: (*Vendors, *Food sanitation), (*Food dispensing, Food sanitation), Regulations.

The report contains suggested recommendations for ordinances and codes relative to sanitary practices applicable to the design, construction, maintenance, and operation of food vending machines.

PB-216 242
Oak Ridge National Lab., Tenn.
STATISTICAL EVALUATION OF PACKING HOUSE WASTE DATA,
Conrad P. Straub. 1953, 32p
Presented at the Industrial Waste Conference (8th), Lafayette, Ind., 5 May 53.

Descriptors: (*Water pollution, *Industrial wastes), (*Food processing, Water pollution)
Identifiers: *Meat packing industry.

The evaluation of packing house waste data, which is to be reported, includes data from many plants, and is believed to be the first extensive statistical evaluation of this type for these waste materials. (Author)

PB-216 243
Public Health Service, Chicago, Ill. Great Lakes-Illinois River Basins Project.
LAKE ERIE WATERSHED STUDY PLAN.
Preliminary rept.

Mar 63, 3?p

Descriptors: (*Lake Erie, *Water pollution).

The report discusses preliminary studies limited to a review of prior water quality studies of Lake Erie and tributaries, the development of an inventory of water supplies and sources of waste water, a study of water uses and water resource management practices, preliminary economic and demo-

graphic studies, and hydrological and meteorological studies.

PB-216 244
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REGISTER OF AIR POLLUTION ANALYSES AS OF JANUARY 1, 1956.
1958, 349p PHS-Pub-610

Descriptors: (*Air pollution, *United States), Tables (Data).
Identifiers: *Air quality data.

Many workers concerned with the problems of community air pollution have recognized the need of assembling in one reference the scattered information relating to past air pollution surveys that exist in the literature of libraries and in files of control agencies, health department, universities and research institutions. The Register of Air Pollution Analyses has been prepared as a step toward filling this need. Contained within the Register is a record of community air sampling and analyses performed in the United States and the Territories of Alaska and Hawaii prior to January 1, 1956. More than 100 different chemically definable individual pollutants or constituents of mixed ones, such as dustfall, are listed for 200 cities in 110 counties of 32 states and territories.

PB-216 245
Advanced Waste Treatment Research Program, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ADSORPTION OF BIOCHEMICALLY RESISTANT MATERIALS FROM SOLUTION. 1.
Environmental health series,
J. Carrell Morris, and Walter J. Weber, Jr. May 64, 92p AWTR-9 PHS-Pub-999-WP-11
Contract SAph-76295

Descriptors: (*Activated carbon treatment, Organic compounds), (*Sewage treatment, Activated carbon treatment).

The Advanced Waste Treatment Research Program of the Public Health Service has two ultimate goals: One is to help abate our Nation's growing water pollution problems, and the other, more startling in concept, is to renovate waste water for direct and deliberate re-use. Conventional water and waste treatment practices have little or no effect on many simple inorganic salts and permit an ever-increasing number and amount of highly complex, synthetic organic wastes to contaminate drinking water supplies. The present report describes the experimental program on the Kinetics of adsorption on granular carbon as a further investigation for waste and water treatment.

PB-216 246
Public Health Service, Washington, D.C. Div. of Radiological Health.
RADIOCHEMICAL DETERMINATION OF URANIUM IN ENVIRONMENTAL MEDIA BY ELECTRODEPOSITION.
Environmental health series,
Harry Levine, and Anthony Lamanna. Mar 65, 28p PHS-Pub-999-RH-11
Library of Congress catalog card no. 65-60019.

Descriptors: (*Uranium, Chemical analysis), (*Electrodeposition, Uranium), Radioactive contaminants, Trace elements.

As part of its program for evaluating the many aspects of radiation exposure, the Public Health Service maintains a continuing interest in the research and development of analytical methods for uranium concentrations in various media. The Radio-chemistry Support Laboratory of the Division of Radiological Health investigated new techniques and modifications applicable to determinations of micro or macro amounts of uranium in environmental media and certain biological materials. Appropriate environmental samples may be air filters, food, water, soil, and vegetation - all of which are collected under PHS radiation surveillance activities. (Author)

PB-216 247
Federal Water Pollution Control Administration, Washington, D.C.
BULLETIN OF COURSES. WATER POLLUTION CONTROL TECHNICAL TRAINING PROGRAM. JULY 1968 TO JUNE 1969.
Clean water rept.
1969, 48P

Descriptors: (*Water pollution, *Education).

The report contains a listing of courses and course descriptions, training programs, and levels of learning offered by the Federal Water Pollution Control Administration.

PB-216 248
National Cancer Inst., Bethesda, Md.
SURVEY OF COMPOUNDS WHICH HAVE BEEN TESTED FOR CARCINOGENIC ACTIVITY. SUPPLEMENT I.
Philippe Shubik, and Jonathan L. Hartwell. 1957, 390p PHS-Pub-149
Prepared in cooperation with Chicago Medical School, Chicago, Ill.

Descriptors: (*Carcinogens, *Reviews).

This supplement to Survey of Compounds Which Have Been Tested for Carcinogenic Activity has retained the format of the previous two editions with some minor modifications. Radioactive materials have not been included on this occasion because it was felt inappropriate to classify these materials on the basis of their chemical structure rather than physical properties. It can be seen that the proportion of carcinogens among the new compounds (21%) is similar to that found before (23%). In view of the greatly increased interest in carcinogenesis as a problem of human environmental cancer, it is of great importance to analyze the significance of this proportion.

PB-216 249
Halliburton Co., Duncan, Okla.
FEASIBILITY STUDY ON THE APPLICATION OF VARIOUS GROUTING AGENTS, TECHNIQUES AND METHODS TO THE ABATEMENT OF MINE DRAINAGE POLLUTION. PART IV. ADDITIONAL LABORATORY AND FIELD TESTS FOR EVALUATING AND IMPROVING METHODS FOR ABATING MINE DRAINAGE POLLUTION.
Final rept.
15 Apr 68, 240p
Contract DI-14-12-31
Report of Monongahela River Mine Drainage Remedial Project, Upper West Fork River Sub-Basin, W.Va. See also Part II, PB-216 238.

Descriptors: (*Coal mines, *Sealing), (*Water pollution, Mine water), Grouting, Seismic surveys, West Virginia.
Identifiers: *Water pollution control, *Mine acid drainage.

The initial phase of this project involved the studies and investigations performed in the exploration of drift mines in the Upper West Fork River Sub-basin, West Virginia. Included as a part of the study was the application of various grouting agents and techniques to the abatement of mine drainage pollution. Part IV of the project is a modification of the original contract for the purpose of conducting additional field tests on methods and materials not previously evaluated in this project. The Part IV program includes an experimental test program, a seismic survey and study, and field construction tests and evaluation. The experimental test program was conducted for the purpose of determining improvements in techniques and materials previously used for remedial applications as well as consideration of different techniques which might be evaluated in field tests. The seismic survey and study included was for the purpose of locating hidden mine openings or thin high wall sections by seismic methods.

PB-216 250
Public Health Service, New York. North Atlantic Drainage Basins Office.
DELAWARE RIVER BASIN. ZONE 4. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION CONTROL.
Water pollution series.

Apr 53, 82p PHS-WPS-58 PHS-Pub-295
Prepared in cooperation with Delaware Water Pollution Commission, Delaware State Board of Health, New Jersey State Dept. of Health and Pennsylvania Dept. of Health.

Descriptors: (*Delaware River Basin, *Water pollution), (*Delaware, Water pollution), (*Pennsylvania, Water pollution), (*New Jersey, Water pollution).

The report considered the water pollution problems of the Delaware River Basin as a whole. This report contains pollution data available as of April 1953 and relates to water pollution control measures in Zone 4 of the Delaware River Basin.

PB-216 251
Public Health Service, Atlanta, Ga. Southeast Drainage Basins Office.
ST. JOHNS RIVER BASIN, REPORT ON WATER POLLUTION CONTROL.
Water pollution series.
Oct 51, 97p PHS-Pub-134, PHS-WPS-27

Descriptors: (*Saint Johns River Basin, *Water pollution), (*Florida, Water pollution).

A review is made of the water resources, economy, and natural environment of the subject river basin, followed by a discussion of the area's waste disposal methods, hazards, and pollution control requirements.

PB-216 336
Abt Associates, Inc., Cambridge, Mass.
INCENTIVES TO INDUSTRY FOR WATER POLLUTION CONTROL: POLICY CONSIDERATIONS.
Dec 67, 109p
Contract DI-14-12-138

Descriptors: (*Water pollution, Abatement), (*Industries, Water pollution), Cost analysis, Economic analysis.
Identifiers: *Water pollution abatement, *Tax incentives.

The study is an examination of alternative possible approaches for providing incentives to industry to comply with the pollution abatement standards being created under the Water Quality Act of 1965 and the Clean Water Act of 1966. The study is limited chiefly to manufacturing industry, although there are significant water pollution problems associated with aspects of mining and agriculture as well. The primary focus of the technological analysis is on the problems of organic and inorganic wastes, rather than thermal pollution. Among industrial incentives, it proved impossible to limit consideration to only a few obvious alternatives. In addition to the more straightforward devices like tax incentives, grants, and loans, less direct approaches were also examined, most notably the creation of treatment authorities for a whole area, river basin, or the part of such a basin within a single state. In addition, it became necessary to examine the problem of possible hardship cases, and the question of whether or not

the existing supply of men and material is adequate to produce and maintain the expanded amount of treatment capacity planned under the law. Also included in the report is extensive consideration of the nature of river hydrology and of some aspects of waste abatement technology.

PB-216 337
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
PUBLIC SEWAGE TREATMENT PLANT CONSTRUCTION - 1952,
Carl E. Schwob. 1953, 19p PHS-Pub-291

Descriptors: (*Sewage treatment, *Contracts), Tables (Data).
Identifiers: *Sewage treatment plants.

The report deals with the progress that the cities and towns of the Nation have made during the year 1952 in constructing sewage treatment plants, the means by which pollution from cities is kept under control. (Author)

PB-216 338
Environmental Health Center, Cincinnati, Ohio.
INDUSTRIAL WASTES RESEARCH,
H. H. Black, C. M. Tarzwell, and C. C. Ruchhoft. 1952, 34p
Presented at the Oklahoma Water, Sewage and Industrial Wastes Conference, Stillwater, 4-5 Dec 52.

Descriptors: (*Water pollution, *Industrial wastes), Project planning.

Public Law 845, enacted by the 80th Congress, and approved June 30, 1948, authorizes the Public Health Service to study water pollution problems, including those associated with industrial wastes. The paper pertains to the industrial phase of this portion of the Environmental Health Center program. In the work, emphasis is placed on those industrial wastes having national or regional significance. Cooperation of industry is solicited in the work. (Author)

PB-216 339
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
A REPORT ON THE EXAMINATION OF THE WASTE TREATMENT AND DISPOSAL OPERATIONS AT THE NATIONAL REACTOR TESTING STATION, IDAHO FALLS, IDAHO.
Oct 69, 106p
Prepared in cooperation with Idaho Dept. of Health Boise, Idaho.

Descriptors: (*Nuclear reactors, Water pollution), (*Water pollution, *Snake River), Idaho, Radioactive contaminants.

The report reviews and evaluates the existing waste management operations at the National Reactor Testing Station to determine whether any additional pollution control systems or procedures are necessary or desirable to improve or protect water quality. The NRTS is located near the eastern end of the Snake River Plain in southeastern Idaho. Recommendations for additional water pollution control practices are made to improve and protect the water quality in the Snake Plain Aquifer. They include elimination of disposal wells that discharge waste directly into the ground water supply, the elimination of the use of seepage ponds for the disposal of chemical wastes, and the improvement of some sanitary waste treatment systems.

PB-216 340
National Air Pollution Control Administration, Washington, D.C.
REPORT ON CONSULTATION ON THE NORTHWEST NEVADA INTRASTATE AIR QUALITY CONTROL REGION (NEVADA).
Oct 70, 59p APTD-1204

Descriptors: (*Air pollution, *Nevada).
Identifiers: *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted in Northwest Nevada to gather such information. The results are presented here. They consist of a description of the region, an emission inventory, meteorology, and urban factors.

PB-216 341
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
SYSTEMS ANALYSES OF REGIONAL SOLID WASTE HANDLING,
Norman Morse, and Edwin W. Roth. 1970, 292p
PHS-Pub-2065, BSWM-SW-15c
Contract PH-86-67-254
Library of Congress catalog card no. 70-607064.
Paper copy available from GPO $2.50 as HE20.1402:SX8.

Descriptors: (*Waste disposal, *Regional planning), (*New York, Waste disposal), Management planning.
Identifiers: *Erie County (New York), *Niagara County (New York).

The study develops a systems analysis methodology for regional solid waste management. Although this initial effort is far from comprehensive, it can serve as a model for planners in the application of quantitative techniques for establishing more efficient solid waste systems. (Author)

PB-216 342
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
YAKIMA BASIN COMPREHENSIVE REPORT, BENTON, KITTITAS, AND YAKIMA COUNTIES, WASHINGTON. ECONOMIC BASE ANALYSIS AND PROJECTION, 1960-2010.

Dec 64, 39p Working Paper-52
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Washington (State), Economic development), (*Yakima River Basin, *Economic development), Demography, River basin development.
Identifiers: *Benton County (Washington), *Kittitas County (Washington), *Yakima County (Washington).

Contents:
The economic base study area;
Present economic base and population--
Economic activities, Population;
Projected economic base and population--
Future increases in output and employment of major industries, Future labor force, Estimated future population.

PB-216 343
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
TILLAMOOK COUNTY (OREGON). PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.

21 Jan 65, 14p Working Paper-53
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Oregon, Economic development).
Identifiers: *Tillamook County (Oregon).

Contents: Present population and economic base--Population, General economic base, Lumber and wood products, Agriculture and food processing, Recreation; Estimated future growth--Lumber and wood products, Agriculture and food processing, Services, Future labor force and population, Population distribution.

PB-216 344
Public Health Service, Portland, Oreg. Economic Studies Group.
TOUCHET RIVER AREA (WASHINGTON). PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.

Oct 61, 8p Working Paper-3

Descriptors: (*Touchet River Basin, *Economic development), (*Washington (State), Economic development), River basin development, Demography.
Identifiers: *Columbia County (Washington), *Walla Walla County (Washington).

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of Touchet River Area in southeast Washington. (Author)

PB-216 345
Environmental Health Center, Cincinnati, Ohio.
SOIL ABSORPTION SYSTEMS IN HOUSEHOLD SEWAGE DISPOSAL,
T. W. Bendixen. 1952, 21p
Presented at the American Society of Sanitary Engineering Refresher Course, held at Miami, Fla., on 16 Nov 52.

Descriptors: (*Septic tanks, *Soil properties).

A septic tank-soil absorption system under favorable environmental circumstances is a satisfactory method of residential sewage disposal. Under unfavorable environmental circumstances and if carelessly designed and constructed, such systems are a source of embarrassment and expense to the home owner as well as a problem to the authorities. Soil absorption systems have apparently resulted from a gradual evolution from a privy, to a cesspool, to a seepage pit and to a trench type system. The report discusses the testing and problems of soil absorption.

PB-216 346
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
VIRICIDAL EFFICIENCIES OF DISINFECTANTS IN WATER,
Paul W. Kabler, Norman A. Clarke, Gerald Berg, and Shih L. Chang. 19 May 61, 13p
Presented before the Water and Air Session of the Laboratory Section 1 Nov 60.

Descriptors: (*Disinfectants, Effectiveness), (*Water treatment, *Disinfection), Viruses.

In view of the outbreak of water-borne infectious hepatitis in New Helhi, India, reported in 1960, and the discovery of more than 70 new human enteric viruses, it seems appropriate to review the information available regarding the viricidal efficiencies of disinfectants in water.

PB-216 347
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
POLLUTION CONTROL COUNCIL, PACIFIC NORTHWEST AREA. WATER QUALITY OBJECTIVES.
Nov 66, 36o

Descriptors: (*Pacific Northwest, *Water pollution).

How good is this water. How bad is that water. Will other uses be affected if this treated waste is discharged to this stream. These wastes have been going in here for twenty years and haven't hurt anyone; why do we have to stop now. Pollution control personnel are making decisions daily on these and similar questions. In the Pacific Northwest area many of these decisions had as their basis the Water Quality Objectives and Minimum Treatment Requirements promulgated

in 1952 by the Pollution Control Council. It is the basic purpose of the report to set forth updated and revised water quality objectives which can be used as bases for decision-making.

PB-216 348
Bureau of Solid Waste Management, Rockville, Md.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL (IRGRD). INFORMATION BULLETIN. NUMBER 33, AUGUST 1968.
1969, 29p TT-68-50212/2
Trans. from International Research Group on Refuse Disposal. Information Bulletin (Switzerland) n33 Aug 68. Sponsored in part by National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.

Descriptors: (*Waste disposal, Research), Packaging materials, Composts, Switzerland, Translations.
Identifiers: *Solid waste disposal.

Contents:
Significance of throw-away packaging for water protection and air hygiene, determination of the oxygen requirement of maturing composts, composition and composting of domestic refuse in Cairo, and recent research on refuse disposal in the U.S.A.

PB-216 349
Environmental Health Center, Cincinnati, Ohio.
CHEMICAL OXYGEN CONSUMED AND ITS RELATIONSHIP TO B.O.D,
W. Allan Moore, and C. C. Ruchhoft. 24 Oct 50, 22p
Presented at the Kentucky-Tennessee Industrial Wastes and Sewage Works Association Meeting, held at Memphis, Tenn., on 23-25 Oct 50.

Descriptors: (*Water analysis, *Oxygen).
Identifiers: *Chemical oxygen demand.

The oxidation of organic compounds contained in sewage and polluted water has interested workers in the field of sanitary science for a number of decades. The biochemical oxygen demand (BOD) determines the quantity of oxygen required for biochemical stabilization when a sewage or industrial waste is discharged into a surface water. However, the oxygen consumed test is a measure of the chemical oxidant required to oxidize the organic matter under very special and unnatural conditions, i.e., high acidities and temperatures. The report reviews the test for oxygen consumed and its use in analyzing sewage, industrial wastes, and pollution streams.

PB-216 350
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR OVER CITIES; SYMPOSIUM HELD AT ROBERT A. TAFT SANITARY ENGINEERING CENTER, CINCINNATI, OHIO ON NOVEMBER 6-7 1961.
Technical rept.

Nov 61, 284p SEC-TR-A62-5

Descriptors: (*Air pollution, *Urban areas), (*Meetings, Air pollution).

Contents:
City air - better or worse;
The dispersion and deposition of air pollutants over cities;
Present and future needs for meteorological and air quality observations.

PB-216 351
Federal Water Pollution Control Administration, Cincinnati, Ohio.
ULTIMATE DISPOSAL OF ADVANCED WASTE TREATMENT RESIDUES,
Robert B. Dean. 23 Oct 68, 5p
Presented at the Water and Air Conference of the Technical Association of the Pulp and Paper Industry, held in Portland, Oreg., 1-3 Apr 68. Revision of report dated 13 Jun 68. Pub. in Tappi, v52 n3 p457-461 Mar 69.

Descriptors: (*Sewage treatment, *Waste disposal), Sludge disposal.
Identifiers: *Solid waste disposal.

Advanced waste treatment processes include methods for removing pollutants such as nutrients, suspended matter, dissolved organics, and salts from waste water and concentrating them in a waste stream. Pollutants that are removed from waste waters must be treated so that they will not interfere with the intended use of the environment. The elements of polluting substances may be placed in the air, either on or under the land, and in the oceans. Preliminary conversion to innocuous or nonextractable forms is necessary. (Author)

PB-216 352
Robert A. Taft Water Research Center, Cincinnati, Ohio.
THERMAL REGENERATION OF SPENT POWDERED CARBON USING FLUIDIZED-BED AND TRANSPORT REACTORS,
Edward L. Berg, Roland V. Villiers, Arthur N. Masse, and Lawrence A. Winslow. 1970, 12p
Availability: Pub. in Chemical Engineering Progress. Symposium Series, v67 n107 p154-164 1970.

Descriptors: (*Activated carbon treatment, *Sewage treatment), (*Activated carbon, Regeneration (Engineering)), Fluidized bed processes.

Adsorption on powdered activated carbon has been proven to be a feasible method for removing the bulk of the dissolved organic materials from a municipal secondary effluent. The cost of the carbon is such that it must be regenerated and reused. A transport reactor and a fluidized-bed regeneration furnace were evaluated at the Federal Water Quality Administration's pilot plant at Lebanon, Ohio, regnerating carbon from a 10-gal./min. adsorption system. The carbon was regenerated to near virgin capacity by both furnaces. Physical losses in both systems were near 15%. Operating difficulties with the transport reactor furnace led to the selection of the fluidized-bed furnace for further development. (Author)

PB-216 353
Department of Housing and Urban Development, Washington, D.C. Library.
ENVIRONMENT AND THE COMMUNITY: AN ANNOTATED BIBLIOGRAPHY.
Apr 71, 70p HUD-233-A
Paper copy available from GPO $0.65 as HH1.23:EN8.

Descriptors: (*Pollution, *Bibliographies), (*Urban areas, Pollution), Environments.
Identifiers: *Quality of life.

The bibliography includes reports on environmental degradation; ecology; land use; pollution; urban design; noise; recreational facilities; technology; transportation and highways; and Environmental planning.

PB-216 354
Oregon State Board of Health, Salem.
OREGON SOLID WASTE MANAGEMENT PLAN: STATUS REPORT 1969.

1971, 132p PHS-Pub-2115 EPA-SW-1TSG
Grant PHS-UI-00014
Library of Congress Catalog card no. 76-608478.
Paper copy available from GPO $1.25 as EP3.2:OR3.

Descriptors: (*Oregon, *Waste disposal).
Identifiers: *Solid waste disposal.

Oregon's plan is designed to: (1) begin the planning process; (2) establish policies and procedures to guide the State solid waste agency; (3) guide regional planning; (4) provide a documented base for improved solid waste legislation and operating regulations. The report presents and analyzes pertinent solid waste data, identifies problems indicated by the data, sets objectives that is achieved would solve identified problems, and finally, proposes immediate, intermediate, and long-range measures for achieving objectives.

PB-216 355
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
PROCEEDINGS OF PUBLIC MEETING ON WATER QUALITY MANAGEMENT FOR ESTUARIES, HELD IN SAN FRANCISCO, CALIFORNIA, ON FEBRUARY 18-19, 1969. VOLUME 1.

19 Feb 69, 340p
Report on Clean Water for the Nation's Estuaries. See also Volume 2, PB-216 357.

Descriptors: (*Estuaries, California), (*California, *Water pollution).

The public meeting transcript is an important part of the National Estuarine Pollution Study. The purpose of the public meeting was to receive views on the impact of pollution on California's estuarine system.

PB-216 356
Public Health Service, Washington, D.C.
CLEAN WATER. A CHALLENGE TO THE NATION.
Summary rept.
1960, 48P
Report on Highlights and Recommendations of the National Conference on Water Pollution, Washington, D.C., Dec 60.

Descriptors: (*Water pollution, *Meetings).

The National Conference on Water Pollution held at the presidents request in 1960 included topics on Clean Water from a federal viewpoint and economic viewpoint and also basic data for grants, pollution control, law enforcement, and training.

PB-216 357
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
PROCEEDINGS OF PUBLIC MEETING ON WATER QUALITY MANAGEMENT FOR ESTUARIES, HELD IN SAN FRANCISCO, CALIFORNIA, ON FEBRUARY 18-19, 1969. VOLUME 2.
19 Feb 69, 349p
Report on Clean Water for the Nation's Estuaries. See also Volume 1, PB-216 355.

Descriptors: (*Estuaries, California), (*California, *Water pollution).

Volume 2 continues the compilation of Statements and Reports for the Record of the public meeting allowing all interested to give their views on water quality programs in California.

PB-216 358
Public Health Service, Washington, D.C.
A REPORT OF SPHAEROTILUS GROWTHS IN THE LOWER COLUMBIA RIVER. 1955, 1956, AND 1957.
15 Oct 58, 103p

Descriptors: (*Columbia River, *Sphaerotilus), (*Water pollution, Columbia River), (*Oregon, Water pollution), (*Washington (State), Water pollution), Bacteria, Industrial wastes.
Identifiers: *Water quality data.

Field studies have shown that growth of Sphaerotilus is triggered into nuisance concentrations during certain seasons of the year between Camas and Longview in the Columbia River and between Oregon City and Upper Portland Harbor in the Lower Willamette River. Floods and freshets influence the growth. At such times growths are loosened en masse and transported many miles to points downstream. Moreover, high water and floods shorten time of flow to downstream points so that transportation of nutrients occurs over much longer distances and the range of active slime growth is extended accordingly. The sulfite pulp mills were found a major contributor to the production of Sphaerotilus and associated slimes in the Columbia River. Kraft mills, canneries and domestic sewage are other lesser contributors.

PB-216 359
Federal Water Quality Administration, Norton, W. Va. Norton Mine Drainage Field Site.
REVERSE OSMOSIS TREATMENT OF CONCENTRATED FERROUS IRON ACID MINE DRAINAGE,
Roger C. Wilmoth, and Robert B. Scott. Aug 70, 16p

Descriptors: (*Osmosis, *Mine waters), (*Water pollution, Mine waters), Iron.
Identifiers: *Mine acid drainage, *Water pollution control, *Reverse osmosis.

A 4,000 gpd reverse osmosis unit was tested on a severely polluted ferrous iron acid mine discharge near Morgantown, West Virginia. The water recovery rate was limited to fifty percent due to membrane fouling problems. The role of ferrous iron fouling could not be identified because of a predominance of calcium sulfate precipitation on the membranes. The feasibility of reverse osmosis treatment is doubtful for mine drainage having concentrations of acidity, iron, sulfate, and calcium as high as 5,000 mg/l, 2,300 mg/l, 10,000 mg/l and 525 mg/l, respectively, due to the membrane fouling problem, maximum recoveries of only 50 percent, and the non-potable quality of the product water. (Author)

PB-216 360
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ESTUARINE AND MARINE POLLUTION (SELECTED STUDIES).
Technical rept,
William Marcus Ingram, and Thaddeus A. Wastler, III. 1961, 34p SEC-TR-W61-4

Descriptors: (*Water pollution, Bibliographies), (*Estuaries, Water pollution), (*Oceans, Water pollution).

The references selected present an insight into the biological, bacteriological, and physical aspects relating to disposal of wastes into estuarine and marine waters. This bibliography was assembled to be used as a training aid for those concerned with the complexities of disposal of wastes into tidal waters. The majority of references cited are of United States or Canadian origin. Most are generally available in university libraries in this country.

PB-216 361
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
EXTENDED-AERATION SEWAGE TREATMENT: A PRELIMINARY EVALUATION.
Technical rept.
1960, 48P SEC-TR-W60-6
Report on Waste Treatment Studies.

Descriptors: (*Sewage treatment, Aeration), (*Activated sludge process, *Aeration).
Identifiers: *Sewage treatment plants.

The Public Health Service initiated a project to evaluate the experience of the States with 'extended aeration' plants and to collect and review available data and performance records. The study was limited to plants of 20 to 2,500 population equivalent utilizing the extended-aeration process. Laboratory data from 59 of the 1,224 plants form the basis of the performance evaluation. Extended-aeration plants with proper design, maintenance, and operation can effect high BOD reductions. Records show a wide range of efficiencies with an average of 86 percent BOD removal. Suspended solids removal is less, averaging 62 percent and ranging from 0 to 96.5 percent.

PB-216 362
Environmental Health Center, Cincinnati, Ohio.
TASTE AND ODOR PRODUCING COMPONENTS IN PETROLEUM REFINERY GRAVITY OIL SEPARATOR EFFLUENTS,
C. C. Ruchhoft, F. M. Middleton, Harry Braus, and Aaron A. Rosen. Mar 53, 27p
Presented at the National Meeting of the American Chemical Society (123rd), Los Angeles, Calif., 15-19 Mar 53.

Descriptors: (*Water pollution, *Taste), (*Odors, Water pollution), (*Refineries, Water pollution).

The control of tastes and odors in drinking waters obtained from surface water sources is a major problem in water purification. Tastes and odors in surface waters may come from aquatic plants such as algae natural land drainage, and the discharge of domestic sewage and industrial wastes. The odor bearing materials, largely organic, may undergo physical and chemical changes as a result of sedimentation, vaporization, oxidation, temperature and light effects, and biochemical action. The study was undertaken to determine the types and quantities of materials present in petroleum refinery gravity oil separator effluents that contribute to taste and odor when discharged into surface waters used as drinking water sources. (Author)

PB-216 363
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
DEMONSTRATE THE EFFECTIVENESS OF IODINE FOR THE DISINFECTION OF PUBLIC WATER SUPPLIES AND TO DETERMINE THE PHYSIOLOGICAL EFFECTS ON A HUMAN POPULATION.
Progress rept. no. 1,
A. P. Black. Nov 63, 13p
Grant WPD-19-01-63

Descriptors: (*Disinfection, *Iodination), (*Water treatment, Iodination).

The report briefly discusses progress made on the project in 1963.

PB-216 364
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
SPECTROPHOTOMETRIC DETERMINATION OF BUTENES AND HIGHER MOLECULAR WEIGHT OLEFINS IN COMBUSTION GASES AND IN THE ATMOSPHERE.
A. P. Altshuller, and S. F. Sleva. 1961, 46p

Descriptors: (*Gas analysis, *Alkene hydrocarbons), (*Air pollution, Alkene hydrocarbons), Exhaust gases, Colorimetric analysis, Spectroscopic analysis.
Identifiers: *Air pollution detection.

Four-carbon and higher molecular weight olefins can be quantitatively determined in the gas phase by reaction with p-dimethylaminobenzaldehyde in concentrated sulfuric acid, heating at 100 degrees, and measurement of the absorbance at 500 micrometers. The absorptivities are such that 0.1 ppm or less of gaseous olefins can be determined. Interference by formaldehyde is appreciable. Excess amounts of aromatic hydrocarbons and phenols interfere somewhat in the procedure. Simple methods for removing possible interferences in gas mixtures are discussed. The method has been applied to the analysis of automobile exhaust and diluted irradiated exhaust mixtures. (Author)

PB-216 365
Environmental Health Center, Cincinnati, Ohio.
SCIOTO RIVER STUDIES LOW FLOW PERIOD SEPTEMBER 1953-JANUARY 1954.

1954, 130p

Descriptors: (*Scioto River, *Water pollution), (*Ohio, Water pollution).
Identifiers: *Water quality data.

The principal purpose of the report is to present findings of fact and opinion in relation to the use of the Scioto River (at a point 34 miles from the mouth) as a source of raw water supply for the Atomic Energy Commission's Portsmouth Plant near Piketon, Ohio. Treated water from this source will be used for industrial purposes and its use for domestic purposes is under consideration. At present water for domestic purposes is obtained from wells located near the Scioto River about 29 miles from the mouth. Consequently data and discussion relating to ground water quality are also included.

PB-216 366
Cincinnati Univ., Ohio.
FOAM FRACTIONATION WITH REFLUX.
Progress rept. 1 Sep 64-30 Nov 66,
Robert Lemlich. 1 Dec 66, 61p
Contract FWPCA-WP-00161

Descriptors: (*Flotation, *Chemical engineering), Theories.
Identifiers: *Foam fractionation.

The theoretical model for foam drainage and overflow, which was developed earlier, was tested in detail against experimental data. This data was gathered from foam fractionation columns, the operation of which included reflux, no reflux, pool feed, and foam feed. The test yielded good agreement. The theory was also tested against experimental data for stationary foam draining at steady state. This too yielded good agreement. The theoretical model was then extended to stationary foam in unsteady state drainage by combining it with a differential mass balance and suitable boundary conditions. A comparison of theoretical prediction with experimental measurement indicated that the effect of bubble coalescence in the foam can be very important in this situation. (Author)

PB-216 367
Environmental Health Center, Cincinnati, Ohio.
BIOLOGICAL OBSERVATIONS AND TOXICITY BIOASSAYS IN THE CONTROL OF INDUSTRIAL WASTE DISPOSAL,
Peter Doudoroff. 1951, 27p
Presented before the Industrial Waste Conference, (6th), Lafayette, Ind. 21-23 Feb 51, also Pub. in the Purdue Univ. Engineering Extension Bull., no. 76, v35 n6 p88-105 1951.

Descriptors: (*Water pollution, *Biological surveys), Bioassays.

Many established facts and valid conclusions pertaining to biological criteria by which the intensity of pollution can be judged already have been fully and clearly presented and need not be restated. However, some strikingly contradictory views are frequently encountered. Therefore, the present general discussion, based on a critical survey of pertinent literature and personal experience in the field of pollution control, may be helpful in the planning of biological studies. Bacteriological investigations and methods are not considered. (Author Modified Abstract)

PB-216 368
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
SOUTH PLATTE RIVER BASIN WATER POLLUTION INVESTIGATION. EXHIBITS AND APPENDICES.
Jul 50, 189p
Prepared in cooperation with Bureau of Reclamation, Washington, D.C. Colorado State Dept. of Public Health and City and County of Denver, Colo.

Descriptors: (*Platte River Basin, *Water pollution), (*Colorado, Water pollution), Food processing, Industrial wastes, Legislation.
Identifiers: *Denver County (Colorado), *Water quality data.

The following exhibits and appendices are presented to supplement an investigation on South Platte River Basin water pollution: Colorado-Big Thompson Project; Blue-South Platte River Project; Stream pollution survey of the portions of the South Platte River and Cherry Creek which lie within the city and county of Denver; Sample reports on typical wastes investigations; State water pollution control legislation; Beet sugar wastes investigations; Bacteriological study of irrigated fruits and vegetables; Project effects on low-flow conditions in the South Platte River Basin.

PB-216 369
Bureau of Waste Management, Rockville, Md.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL (IRGRD). INFORMATION BULLETIN. NUMBER 32, APRIL 1968.

1969, 44p
Trans. from International Research Group on Refuse Disposal. Information Bulletin (Switzerland) n32 Apr 68. Sponsored in part by National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.

Descriptors: (*Waste disposal, Research), Earth fills, Composts, Sludge disposal, Garbage disposal, Switzerland, Translations.
Identifiers: *Solid waste disposal.

Contents:
Controlled tipping, energy expenditure in the pasteurization of sludge, cost-saving in the use of garbage trucks, and oxidation-reduction potential and hygienic state of compost from urban refuse.

PB-216 370
Bureau of Solid Waste Management, Rockville, Md.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL (IRGRD). INFORMATION BULLETIN. NUMBER 35, MAY 69.

1969, 49p TT-69-55107/1
Trans. from International Research Group on Refuse Disposal. Information Bulletin (Switzerland) n35 May 69. Sponsored in part by National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.

Descriptors: (*Waste disposal, Research), Sludge disposal, Dewatering, Composts, Switzerland, Translations.
Identifiers: *Solid waste disposal.

Contents:
Dewatering of sewage sludge by centrifuge, and Determination of the degree of maturity of refuse compost.

PB-216 371
Environmental Control Administration, Cincinnati, Ohio.
SPECIAL ANALYTICAL TECHNIQUES IN ENVIRONMENTAL MEDIA - THIN LAYER CHROMATOGRAPHY. TRAINING COURSE MANUAL.

Feb 70, 69p

Descriptors: (*Thin layer chromatography, *Manuals), Education.

This course is designed for technically trained personnel in control and regulatory laboratories concerned with problems associated with food protection, occupational health, and water hygiene. (Author)

PB-216 372
Bureau of Solid Waste Management, Rockville, Md.
AN EVALUATION OF SEVEN INCINERATORS,
W. C. Achinger, and L. E. Daniels. 1970, 41p EPA-SW-51ts
Pub. in Proceedings of the National Incinerator Conference, Cincinnati, Ohio, 17-20 May 70, p32-64.

Descriptors: (*Waste disposal, *Incinerators), (*Air pollution, Incinerators), (*Water pollution, Incinerators), Performance evaluation, Cost estimates.
Identifiers: *Solid waste disposal.

In an evaluation of seven incinerators that process municipal solid waste, data have been gathered on the quality and quantity of solid waste processed, residue, and gasborne particulate emissions, the quality of the fly ash collected and the wastewater produced, and the economics involved in incineration. These data are compared and the study results summarized. The sampling procedures being used and the problems encountered during their evolution are also described. (Author)

PB-216 373
Public Health Service, Portland, Oreg. Economic Studies Group.
YAKIMA RIVER BASIN HYDROLOGY AND WATER QUALITY DATA AND CALCULATIONS,
D. Dubois. Aug 63, 33p Working Paper-45

Descriptors: (*Yakima River Basin, *Water pollution), (*Oregon, Water pollution), Hydrology, Stream flow.

The purpose of the working paper is to set forth the data and information which has been collected in the Yakima Basin and to show calculations and methods of analysis used in making the various determinations appearing in Public Health Service reports on the Basin.

PB-216 374
Public Health Service, New York. Region II.
RARITAN BAY CONFERENCE, 22-23 AUGUST 1961. REPORT ON POLLUTION OF INTERSTATE WATERS OF RARITAN BAY,
F. W. Kittrell. Aug 61, 111p

Descriptors: (*Raritan Bay, *Water pollution), (*New York, Water pollution), (*New Jersey, Water pollution).

On the basis of reports, studies and surveys indicating that a water pollution problem existed in the interstate waters of Raritan Bay, and because of the reported hepatitis outbreak associated with these polluted waters, the Surgeon General of the Public Health Service called a conference as a first step under Section 8 of the Federal Water Pollution Control Act of 1956. Topics discussed are reported.

PB-216 375
Public Health Service, Kansas City, Mo. Region VI.
WATER RESOURCES STUDY MISSISSIPPI RIVER HEADWATERS RESERVOIRS MINNESOTA.
Dec 63, 78p
Library of Congress catalog card no. 70-614773.

Descriptors: (*Mississippi River Basin, *Reservoirs), (*Minnesota, *Water resources).

The report describes a study made to determine the present and prospective needs and values of storage in the existing headwaters reservoirs for municipal and industrial water supply and water quality control from the Mississippi River Headwaters to the junction of the St. Croix River below the Minneapolis-St. Paul Standard Metropolitan Statistical Area. The scope of this investigation covers the base year (1965) and the 50-year projections (2015) of the requirements for M and I water supply and water quality control purposes. (Author)

PB-216 376
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION PROGRAM OF THE DIVISION OF SANITARY ENGINEERING SERVICES,
Arthur C. Stern. 21 Sep 55, 13p
Pub. in Proceedings of a Seminar on Air Pollution Problems, 20-21 Sep 55.

Descriptors: (*Air pollution, Government policies).
Identifiers: Government agencies.

Since many air pollution control officials are unfamiliar with the make-up of the Department of Health, Education, and Welfare, and of the Public Health Service, advantage is taken of this opportunity to explain their organizational structures, with particular attention to its air pollution program.

PB-216 377
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PROCEEDINGS OF A SEMINAR ON AIR POLLUTION PROBLEMS, HELD AT THE ROBERT A. TAFT SANITARY ENGINEERING CENTER, CINCINNATI, OHIO, ON SEPTEMBER 20-21 1955.

1955, 146p

Descriptors: (*Air pollution, *Meetings), Regional planning, State government.

A Seminar on the organization and administration of State air pollution programs was conducted at the Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio, on September 20 and 21, 1955. The objective of the Seminar was to provide an opportunity, particularly for representatives of State governmental agencies, to discuss common problems relating to the organization and administration of air pollution activities. Invitations to attend were extended to representatives designated by each State and territorial government, counties having air pollution control organizations, and cities of over half a million corporate population. The report contains the proceedings of the Seminar. (Author Modified Abstract)

PB-216 378
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
DETERGENTS AS THEY AFFECT THE SEWAGE TREATMENT PLANT,
Archie E. Becher, Jr. 1957, 28p
Presented at the Arkansas Water and Sewage Conference Annual Meeting, Little Rock, Ark., 18 Mar 57.

Descriptors: (*Sewage treatment, *Detergents), Retarding, Surfactants.

Frothing which is both a hazard and a nuisance, has frequently been associated with increased detergent use. Froth control may be accomplished by plant operational methods, sprays, defoamers, or a combination of these devices. Foam control of any kind costs money and determination of the best type of control depends on the individual plant. Evidence has been presented, in spite of some disagreement in the field, to indicate that detergents do interfere with sedimentation, coagulation, trickling filters, the activated sludge process, and sludge digestion. It does appear that different detergents have different effects on the treatment processes, and that the activated sludge process is most susceptible to their interference.

PB-216 379
Environmental Health Center, Cincinnati, Ohio.
MEMORANDUM ON THE DETERMINATION OF PHENOLS IN THE MIXED WASTE FROM A CHEMICAL MANUFACTURING PLANT,
C. C. Ruchhoft, W. A. Moore, and R. C. Kroner. 1 Aug 49, 7p

Descriptors: (*Chemical industry, Water pollution), (*Water pollution, Phenols), (*New York, Water pollution).
Identifiers: *Buffalo (New York).

At a meeting on March 22, 1949 in the offices of the National Aniline Company at Buffalo, New York, attended by representatives of the National Aniline Company; the Public Health Service; the State of New York, and the Buffalo Sewer Authority, the analytical values for phenols in a report of the Buffalo Sewer Authority were discussed. Representatives of the National Aniline Company were of the opinion that the calculated phenol contributions from the wastes given in this report were too great. Exception was also taken to the quantity of cyanide that was attributed to the wastes from the plant. To clarify the values for cyanide and phenol, it was agreed that samples of the waste in question would be submitted to the Environmental Health Center. The results of these tests are presented.

PB-216 380
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT TO THE FEDERAL HOUSING ADMINISTRATION. SEEPAGE PIT CONSTRUCTION NOTES,
Thomas W. Bendixen, Richard E. Thomas, and James B. Coulter. 22 Jun 59, 27p

Descriptors: (*Septic tanks, Construction), Design.

A Study of septic tank-seepage pit systems was made. Design and construction varies tremendously between states and even between counties within one state. Specific practices have been developed through experience and, in many instances, for particular situations. The report summarizes the various construction practices encountered and attempts to delineate the good features from the bad features.

PB-216 382
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION IN ST. BERNARD, OHIO.
Technical rept. 16 Jan-15 Mar 56,
E. C. Tabor, J. E. Meeker, and J. M. Leavitt. 1958, 18p SEC-TR-A58-5

Descriptors: (*Ohio, *Air pollution).
Identifiers: *Air quality data, *Saint Bernard (Ohio).

A two-month (Jan. 16 - March 15, 1956) study to determine the level of air pollution experienced by a residential area in St. Bernard, Ohio, was made.

PB-216 383
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WASTE DISPOSAL ASPECTS OF POTENTIAL PULP MILLS IN WESTERN COLORADO,
H. R. Pahren, and W. W. Town. Apr 60, 23p SEC-TR-W60-5

Descriptors: (*Paper industry, Water pollution), (*Colorado, Water pollution), (*Colorado River Basin, *Water pollution), Industrial wastes.

The Rocky Mountain Forest and Range Experiment Station of the U. S. Forest Service requested the U. S. Public Health Service to evaluate the water pollution aspects of several potential pulp mill sites as a part of a comprehensive study which the Forest Service is making of the opportunity for pulp mill development in western Colorado. This report presents an appraisal of the situation based on present available data.

PB-216 384
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ACTIVATED SLUDGE TREATMENT OF CYANIDE, CYANATE AND THIOCYANATE,
F. J. Ludzack, and R. B. Schaffer. 1960, 32p
Presented at the Industrial Waste Conference (15th), Lafayette, Ind., 2-5 May 60.

Descriptors: (*Activated sludge process, *Cyanides), (*Sewage treatment, Cyanides), (*Cyanates, Sewage treatment), (*Thiocyanate, Sewage treatment), (*Chemical removal (Sewage treatment), Cyanates).

Cyanide, cyanate, and thiocyanate, separately or in combination with other wastes, frequently are waste water problems. Several treatment methods are available for cyanide; some lack the desired efficiency, others are difficult to control, and all have high operating costs. Little information is available on the biological degradation of cyanates. Thiocyanate pollution has a long history but its characteristics commonly are misunderstood or ignored; lower treatment efficiency follows. Since the three anions are related in chemistry, in industry, and in waste control, a group comparison should bring out certain aspects of the individuals that might otherwise be unnoticed. The report discusses the authors' research in this area.

PB-216 385
National Center for Urban and Industrial Health, Cincinnati, Ohio.
SOLID WASTE HANDLING IN METROPOLITAN AREAS.
Jan 68, 44p
Revision of report dated Feb 1964.

Descriptors: (*Urban areas, *Waste disposal).
Identifiers: *Solid waste disposal.

Contents:
The problem;
Public health implications;
Economic impact;
Legal aspects;
Effect of community differences and technological advances;
Lack of public concern;
Development of standards;
Research and training;
The metropolitan-wide approach;
State and local action;
Role of the public health service;
Policy questions;
Bibliography.

PB-216 386
Western Co., Richardson, Tex.
IMPROVED SEALANTS FOR INFILTRATION CONTROL. THE DEVELOPMENT AND DEMONSTRATION OF MATERIALS TO REDUCE OR ELIMINATE WATER INFILTRATION INTO SEWERAGE.
Water pollution control research series.

Jun 69, 96p FWPCA-11020-DIH-06/67, WP-20-18
Contract DI-14-12-146
Errata sheet inserted.

Descriptors: (*Sewers, *Sealing), (*Fluid infiltration, Sewers).

The objective of the program was to develop new, more effective sealants for sewer line leaks (leaking joints, cracks and large holes). This purpose was achieved, and all equipments and materials investigated, tested and compared are presented, along with the test results, supporting data, conclusions and recommendations. A wide range of candidate materials was surveyed, and weaknesses of rejected materials were noted. Cost/effectiveness of the new sealant materials was compared with that of present sealant materials. It was concluded that infiltration adversely influences sewer system operating costs and effectiveness, and that leakage repair systems are limited in their effectiveness. (Author Modified Abstract)

PB-216 387
Federal Water Quality Administration, Portland, Oreg. Northwest Region.
AN EVALUATION OF SALMONID HATCHERY WASTES,
Danforth G. Bodien. Oct 70, 54p

Descriptors: (*Fisheries, *Water pollution), Salmon, Aquaculture.

Throughout the Northwest Region 114 State and Federal hatcheries produce an estimated 8.6 million pounds of salmonid fish annually. In addition, the Region contains numerous private hatcheries and fish farms. In the Hagerman Valley alone such hatcheries produce over 4.5 million pounds annually with a developmental potential of 20 million pounds. Large quantities of water are utilized in raising fish, and generally the water used is discharged without treatment to the receiving stream. In most cases no problems have been associated with this method of operation. Within the past few years, during low summer flows, however, wastes discharged from some hatcheries have created nuisance conditions in receiving waters. The report attempts to define the problem and recommends methods for correction. (Author Modified Abstract)

PB-216 388
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
A REGIONAL WATER POLLUTION PROFILE.
Sep 68, 64p

Descriptors: (*Pacific Northwest, *Water pollution).

Water pollution, in greater or lesser degree, exists in every major Pacific Northwest river except the Kootenai. The report reviews the pollution, its effects, and sources.

PB-216 389
Federal Water Pollution Control Administration, Needham Heights, Mass. New England Basins Office.
MANPOWER NEEDS AT WATER POLLUTION CONTROL FACILITIES IN NEW ENGLAND.
Paul Ferraro. Jun 69, 58p CWT-10-10

Descriptors: (*New England, Manpower), (*Sewage treatment, *Manpower), Requirements.

The Federal Water Pollution Control Administration has evaluated the manpower and training needs of treatment plant operators in New England. The purpose of the survey was to gather information on the existing manpower resource,

salaries, and previous training of operators responsible for the operation of control facilities. Specifically, the report presents an estimate of the existing manpower resource and future needs; compares the salaries of operators with those in comparable occupations; evaluates existing and future training needs; assesses present certification and recruitment programs; and makes recommendations for action to meet the manpower requirements for effective, efficient operation of water pollution control facilities in New England. (Author Modified Abstract)

PB-216 390
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
INTERNATIONAL JOINT COMMISSION TECHNICAL ADVISORY BOARD ON AIR POLLUTION. REPORT ON 1953 ENVIRONMENTAL STUDIES IN THE DETROIT RIVER AREA.
1 Apr 55, 100p

Descriptors: (*Michigan, *Air pollution).
Identifiers: *Air quality data, *Detroit (Michigan).

The report covers the activities carried out in 1953 and presents the results of environmental air pollution appraisal activities which were in progress on the United States side of the international boundary of the Detroit River.

PB-216 391
Public Health Service, Cincinnati, Ohio. Ohio-Tennessee Drainage Basins Office.
ILLUSTRATIONS OF FRESH WATER ALGAE TOXIC TO ANIMALS,
William Marcus Ingram, and G. W. Prescott. Jun 52, 11p

Descriptors: (*Algae, *Toxicity), (*Cyanophyta, *Bibliographies), Aquatic plants, Freshwater biology, Animals, Fishes.
Identifiers: Microcystis, Anabaena, Aphanizomenon, Nodularia, Gloeotrichia, Coelosphaerium.

The algae that have been reported as causing death and, or, illness in domestic animals, fish, and wildlife through toxic action action are, as far as are known, the blue-greens, Cyanophyta. The genera of the Cyanophyta that appear to possess toxic species are: Microcystis, Anabaena, Aphanizomenon, Nodularia, Gloeotrichia, and Coelosphaerium whose illustrations are presented.

PB-216 392
Public Health Service, New York. Div. of Water Supply and Pollution Control.
REPORT ON POLLUTION OF THE HUDSON RIVER AND ITS TRIBUTARIES.

Sep 65, 101p

Descriptors: (*Hudson River Basin, *Water pollution), (*New York, Water pollution).
Identifiers: *Water quality data.

The entire Hudson River, from the Albany-Troy-Rennsselaer area to the Narrows, can be categorically described as polluted. The pollution from the equivalent of more than 10,000,000 persons is discharged to the river in this area. 43% of this is discharged without any treatment or the equivalent of the waste of 4,217,000 people. 38% receive primary treatment. The report includes a description of the area, water uses, source of waste, water quality, and water pollution effects.

PB-216 393
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
WATER POLLUTION PROBLEMS AND IMPROVEMENT NEEDS LAKE ONTARIO AND ST. LAWRENCE RIVER BASINS.

Jun 68, 129p

Prepared in cooperation with New York State Dept. of Health, Albany. Div. of Pure Waters.

Descriptors: (*Water pollution, *Lake Ontario), (*Water pollution, *Saint Lawrence River Basin).

The report summarizes the water pollution problems of the United States water of Lake Ontario and the St. Lawrence River and their tributaries. It identifies the causes of these problems or sources of pollution, discusses the improvements needed, and presents a program of recommended actions. The report is based on extensive field and office studies, initiated in 1964 and still continuing, by the Federal Water Pollution Control Administration's Rochester Program Office; and on information of the New York State Department of Health.

PB-216 394
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
ESTIMATING DIFFUSION CHARACTERISTICS OF TIDAL WATERS,
Hetling, and O'Connell. May 65, 12p CB-SRBP-Technical paper-4

Descriptors: (*Potomac River, Tidewater), (*Estuaries, *Tidewater), Mixing, Mathematical models, Diffusion.

Both the four-thirds law and random process analogy formulas yield effective diffusion coefficients in the proper order of magnitude for the brackish portion of the Potomac Estuary. Either of these formulas should provide useful approximations for other estuaries where good information on salinity variations is not readily available. These formulas should be used with caution in the fresh water portion of tidal rivers, in view of the possible important influence of salinity gradient induced density currents on diffusion. Prototype tracer studies in such locations appear to be necessary to provide reliable estimates of the appropriate diffusion coefficient. (Author Modified Abstract)

PB-216 395
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
AN IN-SITU BENTHIC RESPIROMETER,
O'Connell, and Weeks. Dec 65, 13p CB-SRBP-Technical paper-6

Descriptors: (*Measuring instruments, Oxygen), (*Oxygen, *Benthos), Rivers, Lakes, Estuaries, Biochemical oxygen demand, Water quality.
Identifiers: *Respirometers, Oxygen demand.

Preliminary field tests of an in-situ benthic respirometer yielded reasonable results which are believed to be a satisfactory measure of the benthal oxygen demands actually occurring in the waters studied. Further tests of this measurement technique under a variety of conditions would be desirable to determine more precisely its reliability and general applicability.

PB-216 441
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
IMMEDIATE POLLUTION CONTROL NEEDS, OREGON COAST.

Feb 67, 20p

Descriptors: (*Water pollution, *Oregon), Coasts.

The purpose of the report is to focus attention on known sources of pollution which affect the water use or aesthetic environment and to recommend priorities for action to abate that pollution. The recommendations herein are based on evaluations of data obtained from the Oregon State Sanitary Authority and engineering and economic studies conducted by the Columbia River Basin Comprehensive Project. The report is directed toward the immediate correction or prevention of these existing or potential pollution situations. (Author Modified Abstract)

PB-216 442
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION IN HAMILTON, OHIO.
Technical rept.,
Paul A. Kenline. 1960, 19p SEC-TR-A60-8

Descriptors: (*Ohio, *Air pollution).
Identifiers: *Hamilton (Ohio), *Butler County (Ohio).

At the request of the Hamilton City Health Department, the Public Health Service made an appraisal in Hamilton of factors relative to air pollution. The purpose of the appraisal was to determine the status of the air pollution situation and the need for activity on the part of government in solving air pollution problems. The report is an analysis of data and information assembled on air pollution levels, sources, dispersion, and local control activity. (Author Modified Abstract)

PB-216 443
Environmental Health Center, Cincinnati, Ohio.
REVIEW OF LITERATURE ON STREAM POLLUTION - 1948.

1949, 15p

Descriptors: (*Water pollution, *Reviews), (*Stream pollution, Reviews).

The report reviews such areas as stream biology and bacteriology, chemistry, dissolved oxygen, standards, and surveys.

PB-216 444
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
CARIBOU COUNTY (IDAHO). PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH 1960-2010.
10 Dec 72, 11p Working Paper-38
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Idaho, *Economic development), River basin development, Demography.
Identifiers: *Caribou County (Idaho).

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of Caribou County, Idaho. (Author)

PB-216 445
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
COQUILLE RIVER BASIN. WATER SUPPLY AND WATER QUALITY CONTROL RECONNAISSANCE STUDIES.

Jul 62, 13p Working Paper-26
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Coquille River Basin, *Water supply), (*Oregon, *Water resources), Water pollution.

The report is submitted in accordance with our agreement to supply the Portland District, Corps of Engineers, with preliminary data relative to municipal and industrial water supply and stream quality control considerations associated with reconnaissance studies being conducted by that agency in the Coquille River Basin. The areas and stream reaches of primary concern lie along and downstream from river mile 30 of the South Fork Coquille River and along the main stem Coquille River from the confluence of the North Fork to

the mouth at the Pacific Ocean. (Author Modified Abstract)

PB-216 446
Public Health Service, Portland, Oreg. Economic Studies Group.
CHEHALIS RIVER BASIN (WASHINGTON). PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960--2010.
Jan 72, 8p Working Paper-12

Descriptors: (*Chehalis River Basin, *Economic development), (*Washington (State), Economic development), River basin development, Demography.
Identifiers: *Grays Harbor County (Washington), *Lewis County (Washington), Mason County (Washington).

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the Chehalis River Basin including most of Grays Harbor County, the western halves of Lewis and Thurston Counties, and a small portion of Mason County, Washington area. (Author)

PB-216 447
Public Health Service, Portland, Oreg. Economic Studies Group.
COOS COUNTY (OREGON). PRELIMINARY ECONOMIC RECONNAISANCE AND ESTIMATE OF GROWTH, 1960-2010.

Apr 62, 12p Working Paper-8

Descriptors: (*Oregon, Economic development), (*Coos River Basin, *Economic development), (*Coquille River Basin, *Economic development), River Basin development, Demography.
Identifiers: *Coos County (Oregon).

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of Coos County, Washington. (Author)

PB-216 448
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE BACTERIOLOGICAL AND CHEMICAL BEHAVIOR OF SILVER IN LOW CONCENTRATIONS.
Technical rept.,
Cecil W. Chambers, and Charles M. Proctor. 1960, 21p SEC-TR-A60-4

Descriptors: (*Disinfectants, *Silver inorganic compounds), (*Water treatment, *Disinfection), Bactericides, Bacteria.

Much consideration has been devoted to whether silver, when added to water by mechanisms such as filter beds, electrolytic devices, or as colloidal suspensions, has greater germicidal efficiency than the same amount of silver added as AgNO3. In the present investigation, improved bacteriological and chemical methods, including radioisotope Ag110m, have been used to study the factors affecting the practical application of silver germicides in water treatment. Concentrations of silver are expressed either in terms of dissolved or suspended agent determined by analysis at the time of the test or in terms of silver quantitatively added. (Author Modified Abstract)

PB-216 449
Public Health Service, Denver, Colo. Region VIII.
WATER QUALITY CONTROL STUDY OF THE LITTLE DELL PROJECT, SALT LAKE CITY STREAMS, UTAH: A STUDY OF THE NEED AND VALUE OF STORAGE FOR WATER QUALITY CONTROL.
Aug 65, 12p

Descriptors: (*Utah, *Reservoirs).

A survey has been made which discloses that there is no need for storage for streamflow regulation for the purpose of water quality control in the area. (Author)

PB-216 450
Florida Univ., Gainesville.
DEMONSTRATE THE EFFECTIVENESS OF IODINE FOR THE DISINFECTION OF PUBLIC WATER SUPPLIES AND DETERMINE THE PHYSIOLOGICAL EFFECTS ON A HUMAN POPULATION.
Progress rept. no. 3, 1 Feb 63-31 Oct 65,
A. P. Black. 31 Oct 65, 32p
Grant WPD-19-03-65

Descriptors: (*Water treatment, *Iodination), (*Disinfection, Iodination), Public health.

The water supplies of three state institutions serving approximately 800 individuals and convenient to the University of Florida have been continuously iodinated for a period of more than two years under the most careful chemical, bacteriological and physiological controls. The report presents a year and a half progress report of the results completed on this study.

PB-216 452
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ELECTRONIC ABSORPTION SPECTRA OF INORGANIC AND ORGANIC COMPOUNDS OF NITROGEN. II. BUTYL AND AMYL NITRITES.
Aubrey P. Altshuller, Israel Cohen, and Carol Meyers Schwab. 1957, 19p
Presented at the Air Pollution Symposium of the Meeting of the American Chemical Society (132nd), New York. September 1957.

Descriptors: (*Gas analysis, *Nitrites), (*Ultraviolet spectroscopy, Nitrites), (*Spectroscopic analysis, Nitrites), Ultraviolet spectra.
Identifiers: *Air pollution detection.

The ultraviolet absorption spectra of n-butyl nitrite, t-butyl nitrite, n-amyl nitrite, and i-amyl nitrite in the 2100 to 4000 A. region have been determined in the gas state and in the following solvents: cyclohexane, isooctane, carbon tetrachloride, chlorobenzene, diethyl ether, di-i-propyl ether, p-dioxane, ethyl acetate, acetone, a number of alcohols, and water. (Author Modified Abstract)

PB-216 453
Environmental Health Center, Cincinnati, Ohio.
CHEMICAL WARFARE AGENTS WITH PARTICULAR REFERENCE TO WATER CONTAMINATION,
Harry P. Kramer. 26 Jun 53, 10p
Presented at Engineering Conference, Federal Civil Defense Administration, 25-26 Jun 53, Olney, Md.

Descriptors: (*Military chemical agents, *Water pollution), Tables (Data).

The report presents tables of various properties of chemical warfare agents in water. These include: Chemical behaviour in water (Hydrolysis, solubility); Simple detection procedures; Amount necessary to contaminate water supplies; and Toxicity.

PB-216 454
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
METHODOLOGY FOR EVALUATING THE AIR POLLUTION PROBLEMS OF A STATE,
Donald M. Keagy, Paul A. Kenline, E. R. Hendrickson, and Roy O. McCaldin. 1957, 19p
Presented at the Air Pollution Session of the Annual Meeting of the American Industrial Hygiene Association, St. Louis, Mo. 25 April, 1957.

Descriptors: (*Air pollution, Data acquisition), State government, Questionnaires.

Realizing that pollution of the atmosphere by domestic, industrial and agricultural activities is becoming an ever-increasing environmental problem, some states have recognized the need to assess their current and potential air pollution problems in order to inaugurate prevention and control activities without delay. The methods described here were developed and used in three state-wide air pollution appraisals in Connecticut, Washington, and Tennessee respectively during the past 12 months and will shortly be put to use in a fourth such study in Texas.

PB-216 455
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR-BORNE PARTICULATE EMISSIONS FROM COTTON GINNING OPERATIONS.
Technical rept.
1960, 22P SEC-TR-A60-5

Descriptors: (*Air pollution, *Agricultural wastes), (*Particles, Air pollution), (*Cotton plants, Air pollution).

The objectives of these studies were three-fold: first, to assess the quantity of particulate emissions from cotton ginning operations in terms of its air pollution potential; second, to evaluate the effectiveness of standard laboratory quality evaluation test equipment for predicting these emission values; and third, to develop an economically feasible control technique and suggest control equipment for the reduction of particulate emissions to the atmosphere. (Author Modified Abstract)

PB-216 456
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
A STUDY OF THE OXIDATION DITCH METHOD OF WASTE TREATMENT.
Report for 1 Nov 64-31 Mar 66.
23 Mar 66, 16p
Grant WPD-36-01-65

Descriptors: (*Sewage treatment, Lagoons (Ponds)), Channels (Water ways).
Identifiers: *Aeration ponds.

The report presents the results of a project to evaluate the use of a channel to aerate sewage treatment effluent.

PB-216 457
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
KETCHIKAN, ALASKA BACTERIOLOGICAL SURVEY. TECHNICAL ASSISTANCE AND INVESTIGATIONS.

Aug 69, 26p

Descriptors: (*Tongass Narrows, *Water pollution), (*Alaska, Water pollution), Sewage.
Identifiers: *Sewage treatment effluents, *Ketchikan (Alaska), *Water quality data.

The sewage disposal system at Ketchikan, Alaska discharges raw sewage directly into the adjacent marine waters of Tongass Narrows. The purpose of the study was to document the bacteriological water quality of Tongass Narrows with respect to the effects of raw sewage outfalls from the city of Ketchikan, Alaska. The study was limited geographically to the section of Tongass Narrows between Ward Cove and the Ketchikan U. S. Coast Guard Station. The study was conducted May 7 through May 12, 1969. This time period was selected to avoid possible influence from fish processing wastes discharged to the area later in the season. (Author Modified Abstract)

PB-216 458
Florida Univ., Gainesville.
TO DEMONSTRATE THE EFFECTIVENESS OF IODINE FOR THE DISINFECTION OF PUBLIC WATER SUPPLIES AND TO DETERMINE THE PHYSIOLOGICAL EFFECTS ON A HUMAN POPULATION.
Progress rept. no. 5, 1 Jul 66-28 Feb 67.

10 Mar 67, 59p
Grant WPD-19-04-66

Descriptors: (*Water treatment, *Iodination), (*Public health, Water treatment), Florida.
Identifiers: *Gainsville (Florida).

The water supply of the three institutions has been continuously disinfected with iodine since October, 1963. The general health and thyroid function of the 29 remaining inmates of the original test group were re-evaluated in December, 1966. All continue to be in good health and have no evidence of impaired thyroid function. Thus, there is no evidence in these subjects that long-term use of an iodinated water supply has been deleterious to health. Additional inmates are being examined and added to the test group. Iodine was added to the water supply of the City of Gainesville, Florida, for a twelve-hour period on February 23, 1967. A dosage of 1 ppm was added to the water which contained about 2 ppm of combined chlorine. Iodine residuals were maintained to the ends of the system by reoxidation of the iodide ion. The year's research concerned with the above is discussed.

PB-216 459
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ALGAE IN WATER SUPPLIES. AN ILLUSTRATED MANUAL ON THE IDENTIFICATION, SIGNIFICANCE, AND CONTROL OF ALGAE IN WATER SUPPLIES,
C. Mervin Palmer. 1959, 93p PHS-Pub-657

Descriptors: (*Algae, *Water supplies), (*Water pollution, Algae), (*Phytoplankton, Water supplies), Chlorophyta, Cyanophyta, Diatoms, Dinoflagellata, Identifying, Odors, Taste, Water treatment, Algicides, Weed control, Aquatic plants.
Identifiers: Eutrophication.

Contents:
- Significance of algae in water supplies;
- Identification of algae;
- Taste and odor algae;
- Filter clogging algae;
- Polluted water algae;
- Clean water algae;
- Plankton and other surface water algae;
- Algae attached to reservoir walls;
- Additional problems caused by algae in water supplies;
- Additional uses for algae found in water supplies;
- Procedures for enumeration of algae in water;
- Control of algae.

PB-216 460
Bureau of Solid Waste Management, Rockville, Md.
SUMMARIES. SOLID WASTES DEMONSTRATION GRANT PROJECTS, 1969, FOR GRANTS AWARDED DURING THE PERIOD JUNE 1, 1966-DECEMBER 31, 1968,
Charles E. Sponagle. 1969, 183p BSWM-SW-3d
PHS-Pub-1821
Library of Congress catalog card no. 68-67030.
Paper copy available from GPO $2.00 as stock no. HE20.1102:F0412/969.

Descriptors: (*Waste disposal, *Grants).
Identifiers: *Solid waste disposal.

Each project is identified by title, type, and grant number. The grantee, project director, cost, and duration of the project is shown. Objectives, procedures, a brief statement of progress, and publications resulting from or concerning the project then follow to complete each summary.

PB-216 461
Georgia Inst. of Tech., Atlanta. Water Resources Center.
DIFFUSION OF PARTICLES BY TURBULENCE: EFFECT OF PARTICLE SIZE.
Final rept.,
Hirebdra Majumder, and M. R. Carstens. Dec 67, 112p WRC-0967
Grant FWPCA-WP-00912-02

Descriptors: (*Diffusion, Particles), (*Turbulent flow, Particles), (*Liquid flow, *Particles), Mathematical models, Particle size.

Particle diffusion of six sizes of nylon particles was observed, recorded, and analyzed. The experimental apparatus was designed and the particles were selected to achieve the following: (a) restriction of the particle motion to a horizontal plane thereby eliminating the effect of gravity; (b) elimination of particle-to-particle collisions by observing the motion of widely separated individual particles; (c) elimination of the effect of particle density by using nearly neutrally buoyant particles; and (d) a homogeneous and isotropic field of fluid motion in which particle diffusion occurs without mean motion. The motion of individual particles was recorded on motion-picture film, which was subsequently projected for displacement measurements. (Author Modified Abstract)

PB-216 462
Environmental Health Center, Cincinnati, Ohio.
INDUSTRIAL WASTE SURVEY REPORT ON SUGAR BEET FACTORY WASTES, BUCKEYE SUGAR COMPANY, OTTAWA, OHIO, NOVEMBER 20, 1949 TO NOVEMBER 27, 1949,
Irwin P. Sander, and Paul Agnano. 1950, 43p

Descriptors: (*Food processing, *Industrial waste treatment), (*Water reclamation, Industrial waste treatment), Sugar beets, Chlorination, Process charting.
Identifiers: *Waste water reuse, *Sugar beet processing, *Water pollution control.

The report describes a proprietary process for the chlorination and reuse of process water in the extraction of sugar from suga: beets.

PB-216 463
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
MEMORANDUM ON SECOND CONFERENCE IN GRAND FORKS, N.D. WITH HEALTH OFFICIALS RELATIVE TO THE STREAM POLLUTION INVESTIGATION OF THE RED RIVER OF THE NORTH.

30 Jan 39, 8p

Descriptors: (*Red River of the North, *Water pollution), Proceedings, International relations, United States, Canada, Dissolved gases, Oxygen, Biochemical oxygen demand.

A conference is reported on stream pollution in the Red River of the North held in 1939 in Grand Forks, North Dakota, with particular attention to the biochemical oxygen demand difficulties and the complete absence of dissolved oxygen at the entry point into Canada from the United States.

PB-216 464
Joint District Federal And State Project for the Evaluation of Refinery Emissions.
EMISSION OF HYDROCARBONS TO THE ATMOSPHERE FROM COOLING TOWERS,
Frank Bonamassa, and Yee Sing Yee. Aug 57, 18p
4

Descriptors: (*Refineries, Air pollution), (*Petroleum refining, Air pollution), (*Air pollution, *Hydrocarbons), (*California, Air pollution), (*Cooling towers, Air pollution), Leakage.
Identifiers: *Los Angeles County (California).

Cooling towers in petroleum refineries are a source of hydrocarbon emissions to the atmosphere when the cooling water acquires hydrocarbons in leaking heat exchangers and releases them when passing through the tower. A sampling procedure and an analytical method were developed to measure the hydrocarbon concentration of the water before and after its pass through the cooling tower. Tests revealed that of the 93 cooling towers operating in Los Angeles County, 17 showed detectable emissions totaling about three tons of hydrocarbons per day.

PB-216 465
Federal Water Pollution Control Administration, Washington, D.C.
WATER POLLUTION CONTROL RESEARCH AND TRAINING GRANTS. 1966 GRANT AWARDS: RESEARCH GRANTS, RESEARCH FELLOWSHIPS, TRAINING GRANTS, DEMONSTRATION GRANTS.

1966, 77p WP-29-66

Descriptors: (*Water pollution, *Grants), Research.

The report gives a summary by states as well as complete listing of all of the grants.

PB-216 466
Federal Water Quality Administration, Washington, D.C. Office of Research and Development.
WATER POLLUTION CONTROL RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROJECTS. 1969 GRANT AND CONTRACT AWARDS.
1969, 69p

Descriptors: (*Water pollution, *Grants), Contracts.
Identifiers: Water pollution control.

Contents: Summary of awards by conventional budget elements; Research, development, and demonstration program structure; Summary of awards by program structure; Projects in municipal pollution control technology; Projects in industrial pollution control technology; Projects in agricultural pollution control technology; Projects in mining pollution control technology; Projects in other-sources-of-pollution control technology; Projects in water quality control technology; projects in waste treatment and ultimate disposal technology; Projects in water quality requirements research.

PB-216 467
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER RESOURCES STUDY SAN FELIPE CREEK WATERSHED RIO GRANDE RIVER, TEXAS.

Mar 64, 13p
Report on Study of Potential Needs and Value of Water Storage of Municipal, Industrial, and Quality Control Purposes.

Descriptors: (*San Felipe Watershed, *Water resources), (*Texas, Water resources), Reservoirs.
Identifiers: *Val Verde County (Texas).

The report indicates the water requirements for municipal and industrial, and water quality control purposes to the year 2070 in the San Felipe Creek watershed, a tributary to the Rio Grande River located in Texas. (Author Modified Abstract)

PB-216 468
Environmental Health Center, Cincinnati, Ohio.
TRI-STATE SURVEY OF LAKE MICHIGAN WATERS.
Preliminary rept.

1948, 92P

Descriptors: (*Lake Michigan, *Water pollution), Public health, Bacteria.

The survey was made with particular emphasis on the quality of bathing waters, and it showed wide variations in the sanitary conditions which could produce an effect on the water quality at the beaches. The descriptions and conclusions for each area are discussed for the states of Wisconsin, Illinois, and Indiana.

PB-216 469
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY SOUTH BERRENDO AND BRADY RANCH RESERVOIRS RIO HONDO--RIO FELIX SUBBASINS, NEW MEXICO.
Feb 67, 29p
Report on Study of Needs and Value of Storage for Municipal and Industrial Water Supply and Water Quality Control.

Descriptors: (*New Mexico, Water resources), (*Rio Hondo River Basin, *Water resources), (*Rio Felix River Basin, *Water resources), Reservoirs.
Identifiers: Roswell (New Mexico), *Lincoln County (New Mexico), *Chavez County (New Mexico).

A survey has been made which discloses a future need for municipal and industrial water supplies in the city of Roswell, New Mexico. There is no foreseeable need for storage for water quality control purposes in the project reservoirs. These conclusions are based on results of economic and demographic studies. (Author)

PB-216 470
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY KEYSTONE RESERVOIR ARKANSAS RIVER BASIN, OKLAHOMA.

Jun 66, 75p
Report on Study of Needs and Value of Storage for Municipal and Industrial Water Supply and Water Quality Control.

Descriptors: (*Arkansas River Basin, *Water resources), (*Oklahoma, Water resources), (*Keystone Reservoir, Water resources), Reservoirs.

A survey has been made for the Keystone Reservoir in the Arkansas River Basin, Oklahoma, which discloses a future need for municipal and industrial water supplies and a future need for storage for streamflow regulation for the purpose of water quality control. These conclusions are based on results of economic and demographic studies. (Author Modified Abstract)

PB-216 471
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, SKIATOOK, BIRCH, AND COPAN RESERVOIRS LOWER VERDIGRIS RIVER BASIN OKLAHOMA.
May 66, 37p
Report on Study of Needs and Value of Storage Water Supply and Industrial Water Supply and Water Quality Control.

Descriptors: (*Verdigris River Basin, *Water resources), (*Oklahoma, Water resources), Reservoirs.

The purpose of this study is to evaluate the water requirements for municipal, industrial, and water quality control purposes to the year 2070 in the Candy River and Bird Creek basins, Oklahoma. Estimates are made of the value of benefits attributable to storage of water for these purposes in the proposed Skiatook, Birch, and Copan Reservoirs. (Author Modified Abstract)

PB-216 472
Public Health Service, Cincinnati, Ohio. Ohio-Tennessee Drainage Basins Office.
TENNESSEE RIVER DRAINAGE BASIN.
Summary rept. on water pollution.
1951, 154P

Descriptors: (*Tennessee River Basin, *Water pollution).

The report presents information about the ways out water resources are used, the pollution going into our water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required. Part one considers the water pollution problems of the basin as a whole. Part two presents briefly the data for each of the several sub-basins of the major basin, including a list of projects now known to be needed for water pollution control.

PB-216 473
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
EFFECTS OF THE SAN JOAQUIN MASTER DRAIN ON WATER QUALITY OF THE SAN FRANCISCO BAY AND DELTA. APPENDIX PART C. NUTRIENTS AND BIOLOGICAL RESPONSE. CENTRAL PACIFIC BASINS COMPREHENSIVE WATER POLLUTION CONTROL PROJECT,
Richard C. Bain, Jr., Herbert E. Pintler, Alberto Katko, and Robert F. Minnehan. Aug 68, 155p
Report on Central Pacific Basins Project.

Descriptors: (*San Francisco Bay, *Nutrients), (*Water pollution, San Francisco Bay), (*San Joaquin River, Water pollution), (*California, Water pollution), Limnology, Biological surveys, Aquatic animals.
Identifiers: *Water quality data.

The report describes relationships, data, assumptions, and methodology leading to conclusions involving the effect of increased nutrients on San Francisco Bay and Delta waters and biota. It takes into consideration the future development of the economy of the tributary area, expected changes in the quantity and quality of all waste water sources, planned water resource development projects as they will affect the hydrology of the area, and the uses of Bay and Delta waters that will be required in the future for all legitimate purposes. Material is presented describing laboratory and field studies, literature surveys on fishery resources and water quality requirements, Bay-Delta water quality and biota, and predictive models leading to economic evaluations.

PB-216 474
Federal Water Pollution Control Administration, Washington, D.C.
WATER POLLUTION CONTROL RESEARCH AND TRAINING GRANTS. INDEX OF 1962-1964 RESEARCH GRANT PUBLICATIONS AND REPORTS.

1964, 61p

Descriptors: (*Water pollution, *Grants), (*Research, Water pollution).

The Index contains a numerical list where each grant is identified by the grant number, the project title, project director, and grantee institution of agency; an index to project directors; an index to authors; and an index to research subjects.

PB-216 475
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
SOME NOTES ON THE BULKING OF ACTIVATED SLUDGE AS OBSERVED AT THE TENAFLY, NEW JERSEY, SEWAGE TREATMENT PLANT. JULY-AUGUST, 1931,
Emery J. Theriault, and W. C. Purdy. Nov 32, 91p

Descriptors: (*Activated sludge process, Inhibitors), Retarding, Fungi.
Identifiers: *Tenafly Sewage Treatment Plant.

The report describes studies performed at a New Jersey sewage treatment plant that used the activated sludge process. Particular attention was paid to the immediate oxygen demand of the sludge-sewage mixture and to the dissolved oxygen content of the aerated mixture.

PB-216 476
Federal Water Pollution Control Administration, Washington, D. C.
KEYS TO WATER QUALITY INDICATIVE ORGANISMS. (SOUTHEASTERN UNITED STATES),
Fred K. Parrish. Nov 68, 206p
Errata sheet inserted.

Descriptors: (*Water analysis, *Biological surveys), (*Fresh water biology, Biological surveys), (*Water pollution, Biological surveys), Fungi, Algae, Mollusca, Oligochaeta, Crustacea.
Identifiers: Ephemoroptera, Plecoptera, Trichoptera, Chironomidae.

The manual was written to be used as a reference for Southeastern biologists involved in water quality studies. The keys are designed to supply useable, accurate aids for the identification of organisms usually encountered in water quality surveys. In all except three sections, a sketch is included to illustrate nearly all couplets. The emphasis is directed toward an introduction to the fungi, their occurrence in nature, and a guide to the literature. Accurate, up-to-date, illustrated keys are readily available for the algae and fish. (Author Modified Abstract)

PB-216 477
Federal Water Pollution Control Administration, Washington, D.C.
PROCEEDINGS: CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF LAKE TAHOE AND ITS TRIBUTARIES, HELD AT STATELINE, NEVADA ON JULY 18-20, 1966. VOLUME 1.

1966, 323p

Descriptors: (*Lake Tahoe, *Water pollution), (*California, Water pollution), (*Nevada, Water pollution).

The purpose of the conference was to bring together the State water pollution control agencies, representatives of the Federal Water Pollution Control Administration and other interested parties to review the existing pollution situation, to appraise what has been done, to correct the situation so far, to lay a basis for future action, and give the states and localities an opportunity to take whatever remedial action is possible and practicable under state and local law. (Author)

PB-216 478
National Cancer Inst., Bethesda, Md.
SURVEY OF COMPOUNDS WHICH HAVE BEEN TESTED FOR CARCINOGENIC ACTIVITY. SECOND EDITION,
Jonathan L. Hartwell. 1951, 585p PHS-Pub-149
Revision of report dated 1939.

Descriptors: (*Carcinogens, Tables (Data)), Chemical compounds, Inorganic compounds, Organic compounds, Malignant neoplasms, Mutagens, Neoplasms, Surveys.

The book lists 1329 compounds of which 322 were reported to cause malignant tumors in animals and 35 others to induce only benign ones. The work lists only single compounds. Such complex mixtures as tars, irradiated sterols and articles of diet are not included. Mixtures of two or more compounds given simultaneously are generally excluded. Since the mass of short term pharmacological observations in the literature are not informative as regards tumor-producing potency, only compounds on which observations have been made for at least one month after the first administration have been included. The applications of chemical compounds to all vertebrates excepting fish have been considered. The action of carcinogens on fish, flowering plants, yeasts, bacteria, tissue cultures, isolated tissues, and the like has not been covered. Names have been altered to conform to the Chemical Abstracts system. In addition, trade names and alternate chemical names have been placed in the index of compounds to help in locating certain compounds.

PB-216 479
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY CONSERVATION, ARKANSAS-RED RIVER BASINS. APPENDIX. VOLUME II. WATER QUALITY DATA. PART 3 STREAM UNIFORMITY STUDY DATA AND BASIS FOR CORRELATION OF SPECIFIC CONDUCTANCE AND CHEMICAL ANALYSES, ARKANSAS RIVER BASIN.
Rept. for Jul 60-Sep 62.
Mar 64, 405p

Descriptors: (*Arkansas River Basin, *Water pollution), (*New Mexico, Water pollution), (*Texas, Water pollution), (*Oklahoma, Water pollution), (*Kansas, Water pollution), (*Arkansas, Water pollution), Colorado, Louisiana.
Identifiers: *Water quality data.

The compilation of water quality data collected during the 27-month period of intensive study (July 1960 through September 1962) of the Arkansas-Red River Basins Water Quality Conservation Project is presented in five parts. These data were gathered to provide a basis for (1) location and definition of the significant natural and manmade sources of salt (mineral) pollution, and (2) determination of the effects of these sources on the quality of water in the receiving streams. The intensive investigation of water quality and natural sources of mineral pollution was limited to the central portions of both basins, the area in which major salt sources exist, and mineral pollution is most severe. This report, Part 3, discusses stream uniformity and basis for correlation of specific conductance and chemical analyses in the Arkansas River Basin. (Author Modified Abstract)

PB-216 480
Aerojet-General Corp., Azusa, Calif. Life Systems Div.
SOLID WASTE/DISEASE RELATIONSHIPS: A LITERATURE SURVEY,
Thrift G. Hanks. 1967, 188p PHS-Pub-999-UIH-6, BSWM-SW-1c
Contract PH-86-66-151

Descriptors: (*Waste disposal, *Epidemiology), (*Public health, Waste disposal).
Identifiers: *Solid waste disposal.

The purpose of the study was to review with reasonable thoroughness the scientific literature reporting any relationships between disease and the solid wastes generated by the activities of man. Thus the direction of the study was epidemiologic in nature, and its methods based on the requirements of epidemiologic validation.

PB-216 481
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
DEVELOPMENT OF AN IMPROVED SMOKE INSPECTION GUIDE,
Andre H. Rose, Jr., John S. Nader, and Philip A. Drinker. Jun 57, 23p
Presented at Golden Jubilee Meeting Air Pollution Control Association, St. Louis, Mo., 4 Jun 57.

Descriptors: (*Air pollution, *Smoke), Particles, Transmissometers, Reflectometers.
Identifiers: *Smokemeters, *Air pollution detection.

Present methods of black smoke inspection generally involve visual observation of the degree of blackness of the smoke as it leaves the source, and comparison to a shade of standard blackness. The objective of the present study is to evaluate the performance of both guide types, reflectance and transmittance, and based on this evaluation, to develop a smoke inspection standard. (Author Modified Abstract)

PB-216 482
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NATURAL SOURCES OF GASEOUS POLLUTANTS IN THE ATMOSPHERE,
Aubrey P. Altshuller. 1957, 33p

Descriptors: (*Air pollution, Sources), (*Atmospheric composition, Sources), Abundance, Ozone, Ethylene, Formaldehyde, Methane, Hydrogen, Photochemical reactions, Nitrogen oxides.
Identifiers: *Natural abundance, Biosphere.

The concentration of pollutants within a given political or geographical urban area can arise (1) from combustion or industrial process sources within a given area, (2) from similar sources outside the boundaries of that area or, (3) from natural processes taking place over large areas of the earth's surface or upper atmosphere. The pollution arising from man-made sources outside a given area may come from nearby cities or industrial areas. But the pollutants may also come from distant sites not at all obvious, and perhaps only occasionally offenders, under special meteorological conditions. In the report the methods of production, destruction, and the concentrations of various individual trace gases will be discussed. This can occur as natural releases from the earth's surface, microbiological reactions, and upper atmospheric reactions.

PB-216 483
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE NATIONAL AIR SAMPLING NETWORK,
Elbert C. Tabor. 1957, 15p
Presented at the Air and Water Pollution Conference at Columbia, Missouri on 19 November 1957.

Descriptors: (*Air pollution, Gas sampling).
Identifiers: *National Air Surveillance Networks.

The report briefly reviews the current objectives of the network.

PB-216 484
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
COLORIMETRIC DETERMINATION OF ALKYL NITRITES.

Sep 57, 5p
Presented at Air Pollution Symposium of Div. of Industrial and Engineering Chemistry Meeting (132nd), American Chemical Society, New York City, Sep 57.

Descriptors: (*Nitrites, *Gas analysis), (*Nitrogen dioxide, Gas analysis), Errors, Mixtures.
Identifiers: *Saltzman analysis, *Air pollution detection.

The Griess method (Saltzman procedure) has been used in air pollution work to determine NO2 in laboratory and field operations and it has been adapted for use in automatic instrumentation. In this latter investigation it was shown that alkyl nitrites also react with the reagent in the automatic nitrogen dioxide analyzer used. It appeared of interest to determine the reactivity of the alkyl nitrites directly without also having to consider absorption efficiencies. The amount of reaction on a micromole basis of n-butyl nitrite, t-butyl nitrite, n-amyl nitrite, and i-amyl nitrite was determined for comparison with the reactivity of sodium nitrite and nitrogen dioxide.

PB-216 485
International Joint Commission-United States and Canada.
REPORT OF THE INTERNATIONAL JOINT COMMISSION, UNITED STATES AND CANADA ON THE POLLUTION OF THE ATMOSPHERE IN THE DETROIT RIVER AREA.

Dec 60, 15p
Errata sheet inserted.

Descriptors: (*Air pollution, *Michigan), (*Air pollution, *Canada).
Identifiers: *Windsor (Canada), *Detroit (Michigan).

A report is given on the pollution of the air in the vicinity of the cities of Detroit and Windsor on either side of the international boundary in the area of the Detroit River.

PB-216 486
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
NATIONAL SHELLFISH SANITATION PROGRAM MANUAL OF OPERATIONS. PART I: SANITATION OF SHELLFISH GROWING AREAS,
Leroy S. Houser. 1965, 38p PHS-Pub-33-Pt-1-1965

Descriptors: (*Water pollution, Shellfish), (*Shellfish, Fishing grounds), (*Fishing grounds, Water pollution), (*Food processing, Shellfish), Bacteriology, Standards, Water quality, Public health, Food sanitation, Harvesting, Regulations.

The manual is intended as a guide for the preparation of State shellfish sanitation laws and regulations, and for sanitary control of the growing, relaying, and purification of shellfish. It is intended that States participating in the National Shellfish Sanitation program for the certification of interstate shellfish shippers will be guided by this manual in exercising sanitary supervision over shellfish growing, relaying, and purification, and in the issuing of certificates to shellfish shippers. The manual will also be used by the Public Health Service in evaluating State shellfish sanitation programs to determine if the programs qualify for endorsement.

PB-216 487
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
MANUAL OF RECOMMENDED PRACTICES FOR SANITARY CONTROL OF THE SHELLFISH INDUSTRY. PART II: SANITATION OF THE HARVESTING AND PROCESSING OF SHELLFISH.
1957, 29p PHS-Pub-33-Pt-2-57

Descriptors: (*Shellfish, *Food sanitation), (*Food processing, Shellfish), Fisheries, Sanitation, Hygiene, Standards, Food storage, Public health.

Contents:
- Harvesting and handling shell stock;
- Shucking and packing shellfish;
- Packing and shipping shell stock;
- Repacking of shellfish;
- Reshippers.

PB-216 488
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
COOPERATIVE PROGRAM FOR THE CERTIFICATION OF INTERSTATE SHELLFISH SHIPPERS. PART II: SANITATION OF THE HARVESTING AND PROCESSING OF SHELLFISH,
Eugene T. Jensen. 1962, 36p PHS-Pub-33-PT-2-1962

Descriptors: (*Water pollution, Shellfish), (*Shellfish, *Food sanitation), Harvesting, Food processing, Seafood, Food inspection, Food storage, Bacteriology, Public health, Food packaging.

The manual is intended as a guide for the preparation of State shellfish sanitation laws and regulations, for sanitary control of the harvesting and processing of shellfish, and for the shellfish industry in the maintenance of sanitary conditions during the harvesting and processing of shellfish. It is intended that States participating in the cooperative State-PHS-Industry program for the certification of interstate shellfish shippers will be guided by this manual in exercising sanitary supervision over harvesting, shucking, packing, repacking, and reshipping shellfish, and in the issuing of certificaes to shellfish shippers.

PB-216 489
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SUBURBAN SEWERAGE SYSTEMS,
James B. Coulter. 1957, 18p

Descriptors: (*Sewage treatment, *Communities).
Identifiers: *Suburban areas.

There are four common solutions to the problem of suburban sewage disposal. Although there is no general agreement on the acceptability of all of these methods, listed in order of usual preference they are: Connection to an existing publicly financed sewerage system; Construction of a privately financed community sewerage system; Construction of a treatment system for each house with 'on-lot' disposal of the effluent in soil; Provision for an individual treatment system for each house with discharge of effluent to storm drainage.

PB-216 490
National Center for Urban and Industrial Health, Cincinnati, Ohio.
BACTERIOLOGICAL EXAMINATION OF DRINKING WATER. TRAINING COURSE MANUAL IN WATER SUPPLY AND SEA RESOURCES.

Jan 69, 155p

Descriptors: (*Water treatment, Water analysis), (*Water analysis, *Bacteria), (*Manuals, Water analysis), (*POTABLE WATER, Water analysis), Personnel development, Education.

The report is designed to provide microbiological training for individuals directly involved in the bacteriological examination of drinking water. The training course manual has been prepared especially for the trainees.

PB-216 491
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A WATER POLLUTION SURVEY,
F. W. Kittrell. 1957, 21p
Presented at the Industrial Waste Conference (8th) at Oklahoma State University, Stillwater, on 25 September 1957.

Descriptors: (*Water pollution, Environmental surveys).

Conditions in a polluted stream can change not only from day to day but actually from hour to hour. Therefore a great deal of thought in planning, and care and effort in execution are essential to accomplish a successful stream pollution survey. The report discusses this planning process.

PB-216 492
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RELATIONSHIPS OF AN AIR QUALITY MEASUREMENT TO METEOROLOGICAL PARAMETERS,
E. H. Markee, Jr. Apr 58, 25p
Presented at the Industrial Health Conference, American Industrial Hygiene Association, Atlantic City, N. J. 24 Apr 58.

Descriptors: (*Air pollution, *Atmospheric motion), Wind (Meteorology).
Identifiers: Soiling index.

A two-year joint federal, state, and city-county air quality study was recently completed in the city of Louisville and Jefferson County, Kentucky. An extensive air sampling and meteorological network had been set up for this study. A small sample of the data collected during the course of the study was analyzed to show the relationships of an air quality measurement to meteorological parameters using graphical multiple curvilinear regressions and correlation indices. The air quality measurement selected for use in this analysis was optical density (soiling index) which is an index of smoke concentrations. (Author Modified Abstract)

PB-216 493
Public Health Service, Kansas City, Mo. Region VI.
POLLUTION OF INTERSTATE WATERS. MISSOURI RIVER. RIVER MILES 846.5-642.3 INCLUSIVE, SIOUX CITY, IOWA, JULY 24, 1958. TRANSCRIPT OF CONFERENCE.

Aug 58, 105p

Descriptors: (*Missouri River, *Water pollution), (*South Dakota, Water pollution), (*Iowa, Water pollution), (*Nebraska, Water pollution), (*Kansas, Water pollution), (*Missouri, Water pollution), Meetings.

The conference describes pollution in the interstate waters of the Missouri River involving the states of South Dakota, Iowa, Nebraska, Kansas, and Missouri. The purpose of the conference was to bring together state and local water pollution control agencies and the Public Health Service and other interested parties to review the existing situation. (Author Modified Abstract)

PB-216 494
Public Health Service, Chicago, Ill. Div. of Water Supply and Pollution Control.
TRANSCRIPT OF CONFERENCE ON POLLUTION OF INTERSTATE WATERS OF THE MISSISSIPPI RIVER, IOWA-ILLINOIS, HELD IN CLINTON, IOWA, MARCH 8, 1962.
1962, 141p

Descriptors: (*Mississippi River, *Water pollution), (*Illinois, Water pollution), (*Iowa, Water pollution), Proceedings.

This conference in the matter of pollution of the interstate waters of the Mississippi River, involving the States of Illinois and Iowa and the Department of Health, Education and Welfare, was held under the provisions of the Federal Water Pollution Control Act. The purpose of the conference is to bring together the State water pollution control agencies, the representatives of the United States Department of Health, Education and Welfare, and other interested parties to review the existing situation, the progress which has been made, and to lay a basis for future action by all parties concerned, and to give the states, localities, and industries an opportunity to take any remedial action which may be indicated under state and local law.

PB-216 495
California Univ., Berkeley. Coll. of Engineering.
THE ABSORPTION OF ALKYL AND ALKYLARYL SULFONATES ON POLAR SOLIDS.
Final rept.,
D. W. Fuerstenau, and T. W. Healey. Nov 67, 82p
MT-67-3
Grant FWPCA-WP-00692

Descriptors: (*Surfactants, *Adsorption), (*Sulfonates, *Adsorption), Aluminum oxides, Detergents.

The report is presented as six separate sections, and each section describes the results of one separate research investigation in detail. The sections are the following: The effect of hydrocarbon chain length on the adsorption of sulfonates at the solid-water interface; The aggregation of colloidal alumina dispersions by adsorbed surfactant ions; The heat of immersion of alumina into aqueous sodium dodecyl sulfonate systems; The adsorption of alkylbenzene sulfonates at the alumina-water interface; The effect of surface charge on the adsorption of sodium dodecyl sulfonate by an oxide adsorbent; The effect of inorganic electrolytes on detergent adsorption at water-solid interfaces.

PB-216 496
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigation Station.
STUDY OF THE SEWAGE DISPOSAL PROBLEM AT FORT WORTH, TEXAS, FROM THE STANDPOINT OF ODOR NUISANCE ALLEVIATION IN RESIDENTIAL DISTRICTS,
C. C. Buchhoft. 14 Feb 38, 23p

Descriptors: (*Sewage, *Odors).
Identifiers: *Fort Worth (Texas).

A study was made of the odor nuisance problems created by sewage treatment devices in use in the environs of Fort Worth. This inspection included the municipal sewage disposal plant, the combined preliminary screening and settling plant of the large packing houses, the individual septic tanks of each small packing house, the Marine Creek area, and the Trinity River.

PB-216 497
Environmental Health Center, Cincinnati, Ohio.
THE U. S. PUBLIC HEALTH SERVICE PROGRAM IN INDUSTRIAL WASTE RESEARCH,
V. G. MacKenzie. 1949, 12p
Presented at the Industrial Waste Conference (5th), Purdue Univ., N. Y., 29 Nov 49.

Descriptors: (*Water pollution, *Industrial wastes), Research management.

The industrial waste research program of the Public Health Service is being carried out mainly under the provisions of Public Law 845, officially cited as the 'Water Pollution Control Act' and enacted into law June 30, 1948. The purpose of this paper to give you the highlights of this law as it applies to studies of industrial wastes, the financial provisions for carrying out the responsibilities, and the broad phases of the program now being carried out by the Public Health Service through its grants programs and through the Environmental Health Center at Cincinnati, Ohio. (Author Modified Abstract)

PB-216 498
National Cancer Inst., Bethesda, Md.
CARCINOGENIC BIOASSAYS ON AIR POLLUTANTS,
W. C. Hueper, P. Kotin, E. C. Tabor, Wm. W. Payne, and H. Falk. 1960, 63p
Presented at the Annual Meeting of the Air Pollution Control Association (53rd), 25 May 60, Cincinnati, Ohio.

Descriptors: (*Carcinogrens, *Air pollution), Bioassays, Malignant neoplasms, Lung, Contaminants, Laboratory animals, Neoplasms, Etiology, Public health, United States.

Biossays performed on mice with four subcutaneously injected solvent fractions of the particulate phase of air pollutants of eight cities containing aromatic as well as aliphatic hydrocarbons, yielded cancerous reactions with all four fractions. The cancer yield obtained by the various fractions differed with the fraction as well as with the city from which the air-pollutants were collected. With the exception of air pollutants of Birmingham, which showed the highest total cancer yield and which had also the highest amount of 3.4-benzpyrene, there was no consistent correlation between the degree of carcionogenic potency of the solvent fractions bioassayed, the amount of 3.4-benzpyrene, and the reported lung cancer mortality rate in the eight cities studied. Every community has an atmospheric carcinogenic spectrum which depends upon industrial activities, traffic conditions, climate, solarization, and geologic conditions. An exploration of the relative role and importance of these factors for the lung cancer panorama of individual cities should include an investigation not only of the aromatic and aliphatic hydrocarbons present in the particulate phase of air pollutants but also of metallic, mineralic and radio-active constituents as well as the relative chemical stability and the physical status of some of these elements in the atmosphere.

PB-216 499
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
IN QUEST OF CLEAN AIR FOR BERLIN, NEW HAMPSHIRE.
Technical rept.,
Paul A. Kenline. 1962, 55p SEC-TR-A62-9
Prepared in cooperation with Public Health Service, Washington, D.C. State of New Hampshire, Bureau of Occupational Health, and City of Berlin, N.H.

Descriptors: (*New Hampshire, *Air pollution).
Identifiers: *Berlin (New Hampshire), *Air quality data.

The U. S. Public Health Service, New Hampshire State Department of Health, and Berlin City Health Department conducted an appraisal of the nature, sources, extent, and effects of air pollution in Berlin, New Hampshire. (Author Modified Abstract)

PB-216 500
Joint District, Federal and State Project for the Evaluation of Refinery Emissions.
EMISSIONS OF AIR CONTAMINANTS FROM BOILERS AND PROCESS HEATERS,
Howard Devorkin, and Bernard J. Steigerwald.
Jun 58, 36p 7

Descriptors: (*Refineries, Air pollution), (*Petroleum refining, Air pollution), (*Air pollution, *Industrial wastes), (*California, Air pollution), Boilers, Gas sampling.
Identifiers: *Los Angeles County (California).

Combustion of fuel oil and gas is a source of emissions to the atmosphere. This report details the techniques and results of a study to determine the extent of these emissions from combustion in oil refinery boilers and heaters in Los Angeles County. A total of 21 stacks were sampled during the field testing program. These stacks serve 14 heaters, 10 boilers, and one fume burner. Average emission factors per unit of fuel used were calculated for each contaminant for combustion of both oil and gas. (Author Modified Abstract)

PB-216 514
Oak Ridge National Lab., Tenn.
COMMITTEE ON THE SANITARY ENGINEERING ASPECTS OF NUCLEAR ENERGY - A PROGRESS REPORT,
Conrad P. Straub, Stanley T. Barker, Arthur E. Gorman, Warren J. Kaufman, and James G. Terrill, Jr. 20 Dec 54, 20p

Prepared in cooperation with New York State Dept. of Health, Albany, Atomic Energy Commission, Washington, D.C., California Univ., Berkeley, and Public Health Service, Washington, D.C. Presented at the Annual Meeting, American Society of Civil Engineers, New York, 19 Oct 54. Revision of report dated 9 Oct 54.

Descriptors: (*Radioactive contaminants, *Sewage treatment).

The report is divided into four parts, the first indicates very briefly what the Committee on the Sanitary Engineering Aspects of Nuclear Energy activities have been since its inception, the second includes a statement of the efficiency of conventional water and sewage treatment processes for the removal of radioactive materials, the third covers the radioassay of liquids, and the fourth considers future activities of the Committee. (Author Modified Abstract)

PB-216 535
National Center for Urban and Industrial Health, Cincinnati, Ohio.
BIBLIOGRAPHY OF SELECTED PUBLICATIONS ON ENVIRONMENTAL ENGINEERING AND FOOD PROTECTION.
1966, 20p PHS-Pub-1499

Descriptors: (*Food sanitation, *Bibliographies), Food services, Shellfish, Milk, Public health.

The report is a current list of publications for August 1, 1966 which includes milk, food service and shellfish sanitation; drinking water supply; special engineering services; urban environmental health planning and reports for general public use.

PB-216 536
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ILLUSTRATED FLOW CHART TO CERTAIN GROUPS OF CHIRONOMID LARVAE,
George H. Paine, Jr. 1965, 12p

Descriptors: (*Diptera, *Larvae), (*Water pollution, *Indicator species), Taxonomy, Identifying, Physiology, Morphology.
Identifiers: *Chironomidae, Midges.

Presented is an illustrated flow chart intended to facilitate identification of some common genera and species of Chironomid larvae of North America. Some brief remarks on the morphology and physiology of the family are given. Some of these species are actively favored by pollution and their presence, especially in the absence of intolerant forms may be taken as a strong indication of the presence of organic pollution. Other Chironomids conversely are highly intolerant of pollution, and a diagnosis of 'pollution' based solely on their presence as 'Chironomid larvae', would be a gross error. The importance of generic species identification in interpreting the pollutional significance of this group is thus self-evident.

PB-216 537
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
ARKANSAS-RED RIVER BASINS WATER QUALITY CONSERVATION. APPENDIX VOLUME II. BENEFITS EVALUATION.

Jan 64, 160p
See also Volume 3, PB-216 538.

Descriptors: (*Arkansas River Basin, *Water pollution), (*Red River Basin, *Water pollution), (*Colorado, Water pollution), (*Kansas, Water pollution), (*Oklahoma, Water pollution), (*Arkansas, Water pollution), (*Texas, Water pollution), New Mexico, Louisiana, Economic development.

The volume presents detailed information concerning the value of benefits attributable to an improvement of water quality in the Arkansas-Red River basins, and the general areas likely to be benefited, based upon anticipated water supply needs of the area. Special emphasis is given those segments of the economy which are likely to have the greatest influence on future water use of the Arkansas-Red River basins and adjoining areas. (Author)

PB-216 538
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
ARKANSAS-RED RIVER BASINS WATER QUALITY CONSERVATION. APPENDIX VOLUME III. WATER QUALITY DATA.
Jun 64, 253p
See also Volume 2, PB-216 537.

Descriptors: (*Arkansas River Basin, *Water pollution), (*Red River Basin, *Water pollution), (*New Mexico, Water pollution), (*Texas, Water pollution), (*Kansas, Water pollution), (*Oklahoma, Water pollution), (*Arkansas, Water pollution), Colorado, Louisiana, Tables (Data).
Identifiers: *Water quality data.

The compilation of water quality data collected during the 27-month period of intensive study (July 1960 through September 1962) of the Arkansas-Red River Basins, is summarized. These data were gathered to provide a basis for (1) location and definition of the significant natural and manmade sources of salt (mineral) pollution, and (2) determination of the effects of these sources on the quality of water in the receiving streams. The intensive investigation of water quality and natural sources of mineral pollution was limited to the central portions of both basins, the area in which major salt sources exists, and mineral pollution is most severe. (Author)

PB-216 539
Public Health Service, Cincinnati, Ohio.
PROCEEDINGS OF THE SECOND AIR POLLUTION RESEARCH PLANNING SEMINAR, FEBRAUARY 3-7, 1958.

1958, 357p

Descriptors: (*Air pollution, *Meetings), (*Public health, *Air pollution), Research, Enzymes, Cells (Biology), Respiratory system, Eye (Anatomy), Malignant neoplasms, Allergic diseases, Urban areas.
Identifiers: *Air pollution effects (Animals), *Air pollution effects (Human), Oncology.

Contents:
- The effects of air pollutants upon enzyme systems, cell cultures, and tissues;
- The effects of air pollutants upon man and the intact animal under experimental conditions;
- The effects of air pollutants upon lung function;
- Air pollution and eye irritation;
- Air pollution and cancer;
- Air pollution and allergy;
- Community health studies.

PB-216 540
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
CHEMICAL AND HYDRAULIC CHARACTERISTICS OF THE ANAEROBIC CONTACT PROCESS FOR SEWAGE TREATMENT,
M. B. Ettinger, J. L. Witherow, and J. B. Coulter.
Apr 57, 21p
Presented at Manhattan Waste Treatment Conference (2nd), Apr 57.

Descriptors: (*Sewage treatment, *Anaerobic processes), Design criteria.

Performance characteristics required in a plant to treat sewage from a few houses so that it will be suitable for discharge to open storm sewers have been discussed. The possibility of using anaerobic treatment in simple units is being explored. Some of the hydraulic problems of design, and chemical problems relating to observation of system performance have been presented. The up-flow sludge contact system described shows promise of becoming a useful addition to sewage disposal procedures, particularly for the very small installation.

PB-216 542
Public Health Service, San Francisco, Calif. California and Great Basin Drainage Basins Office.
CALIFORNIA DRAINAGE BASINS. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
1951, 99P PHS-WPS-5 PHS-Pub-86

Descriptors: (*California, *Water pollution), (*Water resources, *United States).

The report is intended to furnish information on the current status of water pollution control in the California Basins, pending completion of comprehensive programs for elimination or reduction of pollution for the 13 Sub-basins in the Basins. Data are presented on the sources of pollution, the uses to which the water resources are being put, and the general condition of these waters. An estimate has been made of the adequacy of the existing treatment facilities and of the need for new treatment works, as well as for additions and extensions to existing facilities. (Author Modified Abstract)

PB-216 543
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
ESTIMATES OF FUTURE POPULATION - DALLAS, INDEPENDENCE AND MONMOUTH (POLK COUNTY).
Nov 61, 8p Working Paper-7
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Oregon, Economic development), (*Willamette River Basin, *Economic development), River basin development.
Identifiers: *Polk County (Oregon), Dallas (Oregon), Independence (Oregon), Monmouth (Oregon).

Estimates of future population of cities are subject to a wider margin of error than those for areas such as counties or river basins because of the additional variable of possible annexations to the cities. In the case of Dallas, Independence, and Monmouth discussed in this report, no attempt has been made to separate the portion of their past growth due to annexations from the portion due to development within previous boundaries. It is assumed, in the following projections, that future growth will represent about the same mixture as it has in the past of (1) annexation and (2) more intensive development of the older area.

PB-216 544
Public Health Service, Kansas City, Mo. Region VI.
WATER RESOURCES STUDY - MARMATON RIVER BASIN, KANSAS AND MISSOURI. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER STORAGE FOR MUNICIPAL, INDUSTRIAL, AND QUALITY CONTROL PURPOSES.
Mar 64, 45p

Descriptors: (*Marmaton River Basin, *Reservoirs), (*Kansas, *Water resources), (*Missouri, *Water resources), Forecasting.

The Kansas City District of the Corps of Engineers requested the Public Health Service to make an investigation of the present and prospective needs for municipal and industrial water supply and for the regulation of streamflow for water quality control in the Marmaton River Basin. The purpose of this study is to determine the need for and value of storage for municipal and industrial water supply and streamflow regulation for quality control in the Marmaton River, a tributary of the Osage River. The study area is the Marmaton River Watershed. The study covers the period of 1960 to 2060. (Author Modified Abstract)

PB-216 545
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
POLLUTION EFFECTS OF PULP AND PAPER MILL WASTES IN PUGET SOUND. A REPORT ON STUDIES CONDUCTED BY THE WASHINGTON STATE ENFORCEMENT PROJECT.
Mar 67, 486p

Descriptors: (*Puget Sound, *Water pollution), (*Washington (State), Water pollution), (*Paper industry, Water pollution), Toxicity.
Identifiers: *Water pollution effects (Plants), *Water pollution effects (Animals), *Water quality data.

The seven pulp and paper mills considered in the report discharge large quantities of process wastes into estuarine waters in four areas of Puget Sound. Greatest concern is the toxic effects of pulping wastes on marine life. Sludge deposits formed by settled waste solids are commonly found in the vicinity of waste discharge. These are usually anaerobic and produce toxic and odorous gases. There is the problem of aesthetic impairment of water quality by colored, odorous, and turbid mill wastes. The document studies in detail the following areas: Everett Harbor and Port Gardner; Guemes Channel, Padilla Bay in the vicinity of Anacortes; Whatcom Waterway at Bellingham; Port Angeles area.

PB-216 546
Dayton Dept. of Water, Ohio. Div. of Sewage Treatment.
TERTIARY TREATMENT OF FLOCCULATION AND RAPID-SAND FILTRATION.
P. J. Fleming, R. F. Scott, and D. F. Tossey. May 69, 125p
Sponsored in part by Federal Water Pollution Control Administration.

Descriptors: (*Sewage treatment, *Chemical removal (Sewage treatment)), Cost estimates.
Identifiers: *Tertiary sewage treatment, Dayton (Ohio).

The goal defined for the study was to demonstrate on a semi-works basis the feasibility of tertiary treatment by chemical coagulation, flocculation, sedimentation, and rapid-sand filtration at a large municipal trickling filter plant.

PB-216 547
Maine Univ., Orono.
USE OF CHEMICAL ADDITIVES TO IMPROVE AERATION RATES. STUDY OF THE BEHAVIOR OF SINGLE BUBBLES,
Progress rept. no. 2a,
Stefan A. Zieminski, and Delmar R. Raymond.
1966, 31p R-848-2a
Grant PHS-WP-00562
See also PB-216 548.

Descriptors: (*Aerators, *Mass transfer), (*Dissolution, *Aeration), Bubbles.

The report deals with construction and testing of equipment for the study of the behavior of a single bubble in the presence of minute quantities of organic substances. The variables proposed for investigation are the velocity of rise, instantaneous dissolution rate, shape, oscillation and effects of age of the bubble on the mass transfer. One of the main objectives of the design of the equipment was to obtain a continuous record of the behavior of the bubble from the moment of its formation to the end of its journey at the top of the column. (Author Modified Abstract)

PB-216 548
Maine Univ., Orono.
USE OF CHEMICAL ADDITIVES TO IMPROVE AERATION RATES. PRELIMINARY STUDY OF MODELS.
Progress rept. no. 2b,
Stefan A. Zieminski, and Martin E. Ray. 1966, 35p R-848-2b
Grant PHS-WP-00562
See also PB-216 547.

Descriptors: (*Aerators, *Mass transfer), (*Dissolution, *Aeration).

Previous investigations conducted with porous plates have shown that some organic substances present, in minute quantities, in an aerated mixture increase the interfacial surface area (A) to such an extent that despite the reduced mass transfer coefficient (K sub L) the total rate of oxygen transfer (K sub L) can be considerably increased. The report deals with a preliminary investigation of three different models of aerators in which the organic agent was introduced at different rates of flow and concentrations. The objective of the tests was to obtain some information about the effects of these variables on quantities such as the bubble diameter, the interfacial area, the mass transfer coefficient, and the total rate of oxygen transfer. (Author Modified Abstract)

PB-216 549
Public Health Service, Portland, Oreg. Region IX.
WATER PROBLEMS IN WATERSHEDS OF THE NORTHWEST,
Edward F. Eldridge. Apr 60, 72p
Proceedings of the Symposium on Water Pollution Research (7th) Held in Portland, Oreg., 12 Apr 60.

Descriptors: (*Pacific Northwest, *Water pollution), Meetings.

The seventh of a series of symposiums which have been held on subjects relating to water pollution concerns what we know or need to know about watersheds and their management as related to the quality of water produced.

PB-216 550
Maryland Univ., College Park. Dept. of Civil Engineering.
REMOVAL OF SUB-MICRON PARTICLES IN ACTIVATED CARBON FILTER BEDS,
John Thomas Cookson, Jr. Dec 68, 92p
Grant FWPCA-WP-981

Descriptors: (*Activated carbon treatment, *Bacteria), (*Colloids, Activated carbon treatment), (*Water treatment, Activated carbon treatment), Absorption, Filtration, Transport properties.

The study was undertaken to provide a better understanding of colloid removal in filter beds. The influence of chemical and physical parameters are evaluated and a model presented to correlate physical filtration parameters to removal efficiency. The removal of the virus Escherichia coli bacteriophage T4 is studied in beds of activated carbon. The report has been divided into three major parts: Studies on the chemical nature and behavior of activated carbon in water; The mechanism of virus absorption on activated carbon; and The physical aspects of filtration. A transport model, based on diffusional transfer in a flowing fluid, is correlated to experimental data.

PB-216 551
Texas Univ., Austin. Environmental Health Engineering Research Lab.
SURPLUS PHOSPHORUS UPTAKE BY MICROORGANISMS. BATCH TESTS WITH DILUTE ACTIVATED SLUDGE CULTURES.
Technical rept. no. 2,
Harry G. Moore, Jr., Robert B. Higgins, and E. Gus Fruh. Feb 69, 53p EHE-69-08, CRWR-41
Grant FWPCA-WP-01449-01

Descriptors: (*Sewage treatment, Phosphorus), (*Bioassay, Activated sludge process), Enzymes, Phosphatases, Microorganism control (Sewage).

An alkaline phosphatase assay based on the use of a p-nitrophenyl phosphate substrate was studied for its applicability to indicate surplus phosphorus uptake by a dilute heterogeneous bacterial culture obtained from an activated sludge process. This investigation demonstrated the validity of the enzymatic bioassay using viable bacterial cells and determined conditions under which the bioassay should be conducted as a standard procedure. Alkaline phosphatase activity was found to be repressed by both orthophosphate external to the cells and by stored phosphorus within the bacterial cells. Based on these studies, the assay appears useful to help elucidate the mechanism responsible for the abnormally high phosphorus removal being attained by various activated sludge plants in the United States. The research also indicates the possible significance of the surplus phosphorus uptake phenomenon in waste treatment processes. (Author)

PB-216 553
Public Health Service, Kansas City, Mo. Region VI.
WATER RESOURCES STUDY, MILFORD RESERVOIR PROJECT, KANSAS RIVER BASIN, KANSAS. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER STORAGE FOR MUNICIPAL, INDUSTRIAL AND QUALITY CONTROL PURPOSES.
Mar 64, 90p

Descriptors: (*Milford Reservoir, Assessment), (*Kansas River basin, *Reservoirs), (*Kansas, *Water resources).

Milford Reservoir is being built on the lower Republican River in the State of Kansas for flood control and other purposes. The study determines the quantities of water that will be needed for municipal and industrial water supply and for water quality control, sets forth the locations at which flow regulation will be needed, identifies the beneficiaries, and estimates the benefits attributable to inclusion of storage in Milford Reservoir to meet these needs. The primary area of influence of Milford Dam is the main stem of the Kansas River, but water draining from the entire basin affects the quality of water in the Kansas River and consequent flow regulation needs. Water supply and quality control needs for the next 100 years have been estimated.

PB-216 554
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
CENTRAL SNAKE BASIN (IDAHO), ECONOMIC BASE STUDY AND FORECAST, 1960-2010.
Nov 65, 80p Working Paper-50
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Snake River Basin, *Economic development), (*Idaho, Economic development), River basin development.

The report describes and tabulates demographic and economic data for the Middle Snake River Basin in Idaho. It also makes projections for the periods 1960 - 1985 and 1985 - 2010.

PB-216 555
Robert S. Kerr Water Research Center, Ada, Okla.
FATE OF DDT AND NITRATE IN GROUND WATER,
Marion R. Scalf, Victor L. Hauser, Leslie G. McMillion, William J. Dunlap, and Jack W. Keeley. Apr 68, 85p FWPCA-16060-04/68
Prepared in cooperation with Southwestern Great Plains Research Center, Bushland, Tex.

Descriptors: (*Water pollution, *Ground water), (*DDT, Water pollution), (*Inorganic nitrates, Water pollution), (*Ogallala Aquifer, Water pollution), Insecticides, Nutrients, Aquifers.
Identifiers: *Path of pollutants.

The report presents findings concerned with the fate of DDT and nitrate under actual recharge conditions in the Ogallala Aquifer of the High Plains area of West Texas and Eastern New Mexico.

PB-216 556
New Mexico State Univ., University Park. Engineering Experiment Station.
CONTROLLING FACTORS IN METHANE FERMENTATION.
Summary of research progress rept. 1 Sep 62 - 1 Sep 64,
R. E. Speece, and R. S. Engelbrecht. 1964, 46p
Grant FWPCA-WP-00394

Descriptors: (*Anaerobic processes, Process variables), (*Sewage treatment, Anaerobic processes), (*Fermentation, *Metabolism), Nutrients, Digestion (Decomposition).
Identifiers: *Methane bacteria.

A number of approaches have been taken in attempting to evaluate the important factors which control the rate of methane fermentation in anaerobic digestion. The ultimate goal of the research has been to determine the chemical, physical, and biochemical requirements which will enable the methane fermentation to proceed at rates on the order of one magnitude greater that commonly observed in conventional anaerobic digestion. A considerably detailed study was conducted to assay the methane fermentation stimulation potential of six compounds which had shown promise in a previous study conducted by the principal investigator. Next, a series of studies was designed to evaluate the influence of many physical and chemical factors involved in digestion. Following this, the methane fermentation requirements for trace organics, such as vitamins and amino acids was studied. Combinations of individual amino acids and vitamins as well as mixtures, e.g. case in hydrolyzate (enzymatic), yeast extract, and fortified vitamin B complex, were assayed for their stimulation potential. The surface charge on the microorganisms was altered by inorganic and organic coagulating agents while observing the acetate utilization rate.

PB-216 557
Public Health Service, Kansas City, Mo. Region IV.
WATER RESOURCES STUDY, GRAND RIVER BASIN, IOWA AND MISSOURI. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER STORAGE FOR MUNICIPAL, INDUSTRIAL, AND QUALITY CONTROL PURPOSES.

Nov 63, 47p

Descriptors: (*Grand River Basin, *Reservoirs), (*Iowa, *Water resources), (*Missouri, *Water resources).

Seven multipurpose reservoirs are proposed for the Grand River Basin. The reservoirs are planned for flood control, municipal water supply, pollution abatement, recreation, and fish and wildlife. Economic projections were made for all or parts of the following counties: Iowa - Ringgold, Decatur, Union, and Adair; Missouri - Worth, Harrison, Mercer, Gentry, Grundy, Sullivan, DeKalb, Daviess, Livingston, Linn, Caldwell, Clinton, and Chariton. The areas studied are within the Grand River drainage basin. The study was made to determine the need for and value of storage for municipal and industrial water supply and streamflow regulation for quality control. The report contains estimates of water requirements for the present and for the years 2010 and 2060.

PB-216 558
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
PROCEEDINGS, SHELLFISH SANITATION WORKSHOP, AUGUST 26-27, 1958,
Eugene T. Jensen. 1958, 74p

Descriptors: (*Food sanitation, *Shellfish), (*Oysters, Food sanitation), (*Water pollution, Shellfish), Seafood, Sewage, Bacteriology, Standards, Food industry, Public health, Meetings.

Contents: Bacteriological standards for shucked eastern oysters; Revision of part I of shellfish sanitation manual; Bacteriological standards for shucked eastern oysters; Standards of identity for shellfish; Administration of the certification program; Construction criteria for shellfish equipment; Paralytic shellfish poison; Disposal of radioactive materials as related to fisheries; Sanitary significance of pink discoloration of shellfish.

PB-216 559
Oak Ridge National Lab., Tenn.
MAXIMUM PERMISSIBLE CONCENTRATION OF RADIOISOTOPES IN AIR AND WATER FOR SHORT PERIOD EXPOSURE,
Karl Z. Morgan, Walter S. Snyder, and Mary R. Ford. 1973, 44p

Descriptors: (*Radioactive isotopes, Radiation dosage), (*Radiobiology, *Radiation dosage), Exposure.
Identifiers: *Permissible dosage.

The purpose of this report is to extend the method of calculation used in the International Commission on Radiation Protection Handbook to estimate the Maximum Permissible Concentrations values or the maximum permissible intake (MPI) of these same radioactive materials for a single exposure. Since the concentration of material in the GI tract reaches equilibrium with that in air and water in a few days, one might suspect that the GI tract frequently would become the critical body organ for short periods of exposure. Another body organ likely to receive a high exposure and as a consequence become the critical body organ for single exposure is the lung. (Author Modified Abstract)

PB-216 560
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER SUPPLY AND POLLUTION CONTROL RESEARCH INVENTORY ACTIVE PROJECTS, 1958,
Frank A. Butrico, Harry A. Faber, and Keene Taylor. 1960, 72p PHS-Pub-768

Descriptors: (*Water pollution, *Research).

The report summarizes data on 280 water supply and pollution control research projects active in the United States during 1958. The information presented was compiled from questionnaires distributed to investigators and administrators known to be conducting or directing research in water, sewage, and industrial wastes. The Inventory is designed to provide a useful record of research underway, and also to facilitate communication between investigators. It includes a brief report of basic data concerning each research project, a comprehensive index of subjects being studied, and an address list for use in the exchange of information. (Author)

PB-216 561
Federal Water Pollution Control Administration, Washington, D.C.
NATIONAL MULTI-AGENCY OIL AND HAZARDOUS MATERIALS POLLUTION CONTINGENCY PLAN.
Sep 68, 45p
Prepared in cooperation with Department of Transportation, Department of Defense, Department of Health, Education and Welfare, and Office of Emergency Planning, Washington, D.C.

Descriptors: (*Hazardous materials, Accidents), (*Water pollution, Hazardous materials), (*Government policies, Hazardous materials).
Identifiers: *Hazardous materials transportation, *Contingency plans, *Oil pollution.

The report documents the U.S. preparedness to deal with a catastrophic oil spill. The plan represents an agreement among concerned Departments and agencies of the Federal government for a pattern of coordinateed and integrated responses to pollution incidents. The objectives of this plan are to develop effective systems for discovering and reporting the existence of a pollution incident, promptly instituting measures to restrict the further spread of the pollutant, application of techniques to cleanup and dispose of the conected pollutants, and institution of action to recover cleanup costs and effect enforcement of existing Federal statutes.

PB-216 562
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
PROCEEDINGS OF CONFERENCE ON RECREATION SANITATION AND SAFETY (1ST), HELD AT LITTLE ROCK, ARKANSAS, ON 25-26 MAY 1965.

1965, 106p PHS-Pub-1428
Sponsored in part by Arkansas State Department of Health, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio and Department of Health, Education, and Welfare, Dallas, Texas.

Descriptors: (*Arkansas, *Recreational facilities), (*Sanitary engineering, *Recreation).

The objectives of the conference were to develop an awareness within Arkansas of the environmental health aspects of planning, developing, operating and maintaining outdoor recreation areas; to emphasize the role of the Arkansas State Department of Health in recreation sanitation and safety; and to unite the numerous aspects of the recreation environment that relate to both sanitation and safety.

PB-216 563
Stanford Univ., Calif. Water Quality Control Research Lab.
WATER RECLAMATION STUDY PROGRAM.
Progress rept. 17 Jul 64-14 Sep 65,
George E. Bennett, Rolf Eliassen, and Perry L. McCarty. Oct 65, 47p
Grant WPD-21-03

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), Activated sludge process, Precipitation (Chemistry), Sewage filtration, Ion exchanging.
Identifiers: *Tertiary sewage treatment.

The report covers the initial stages of the second phase of a project, which is the confirmation of the laboratory work through the operation of a 10 gpm pilot plant located at the Palo Alto Sewage Treatment Plant. The results concern the operating results for the following processes: Activated sludge; Chemical treatment; Filtration; Ion exchange treatment; And economic study is also presented.

PB-216 564
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
QUARTERLY PROGRESS REPORT, OCTOBER 1-DECEMBER 31, 1968.

Jan 69, 41p

Descriptors: (*Water pollution, Research).
Identifiers: *Pacific Northwest Water Laboratory.

The report reviews the Pacific Northwest Water Laboratory's research from October 1 to December 31, 1968. The research delt with the following topics: Coastal pollution; Eutrophication; Waste treatment (Paper and allied products, food wastes); Thermal pollution; Biological effects; Training and manpower development; Consolidated laboratory services program; Technical assistance and investigations; Pollution surveillance.

PB-216 565
Public Health Service, Washington, D.C. Div of Water Supply and Pollution Control.
POLLUTION-CAUSED FISH KILLS IN 1964.

1964, 32p PHS-Pub-847-Rev-1963

Descriptors: (*Water pollution, *Fresh water fishes), Tables (Data).
Identifiers: *Fishkill, *Water pollution effects (Animals).

In 1964, the Public Health Service received 485 official reports of fish kills occurring in various fresh and marine waters of the United States. This was by far the largest number of reports ever received and the number of fish killed was also the largest, an estimated 18,387,000. The report lists these kills as: Historical summary of pollution-caused fish kills; Fish-kill summary by State; Fish kill summary by source of pollution; Fish kills by operations; By type of water body; By type of water; By month; Fish kill summary by severity of kill; Distribution of duration by severity; By degree of severity.

PB-216 566
Edison Water Quality Lab., N.J.
REPORT ON THE SINKING OF THE TANKER 'ARROW', CHEDABUCTO BAY, NOVA SCOTIA,
Thomas A. Murphy. Feb 70, 13p

Descriptors: (*Chedabucto Bay, Water pollution), (*Water pollution, Oils), (*Tanker ships, Water pollution), Bunker oils.
Identifiers: *Oil pollution, *Nova Scotia (Canada), *Oil spills.

The report gives an on-scene description of events accompanying the grounding and subsequent sinking of the Greek oil tanker 'Arrow' in Chedabucto Bay, Nova Scotia, on February 4, 1970. The incident resulted in an oil spill of 16,000 tons of Bunker C oil.

PB-216 567
Public Health Service, Portland, Oreg. Region IX.
RADIOACTIVE WASTE PROBLEMS IN THE NORTHWEST,
Edward F. Eldridge. Nov 60, 78p
Proceedings of the Symposium on Water Pollution Research (8th) Held in Portland, Oreg., 15 Nov 60.

Descriptors: (*Pacific Northwest, Radioactive contaminants), (*Water pollution, *Radioactive contaminants).

The report presents the eighth of a series of symposiums which have been held in this area on subjects related to water pollution. The symposium emphasizes certain phases of the problem of radioactive wastes. It is hoped through these discussions to delineate present-day and anticipated future problems of radiation in waters of the Pacific Northwest and to mark out areas of needed research to meet these problems. (Author Modified Abstract)

PB-216 568
Public Health Service, Boston, Mass. Div. of Water Supply and Pollution Control.
NEW ENGLAND DRAINAGE BASINS: A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series summary rept.
1951, 167P PHS-Pub-88, PHS-WPS-7

Descriptors: (*United States, *Water resources), (*New England, *Water pollution), Connecticut, MAINE, Massachusetts, New Hampshire, New York, Rhode Island, Vermont.

The summary report presents information about the ways the water resources are used, the pollution going into the water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required. It is in two parts. Part one considers the water pollution problems of the basin as a whole. Part two presents briefly the data for each of the several sub-basins of the major basin, including a list of projects now known to be needed for water pollution control.

PB-216 569
Environmental Control Administration, Cincinnati, Ohio. Analytical Reference Service.
WATER CHLORINE (RESIDUAL) NUMBER 1,
R. J. Lishka, E. F. McFarren, and J. H. Parker.
1969, 137p PHS-Pub-1988, PHS-ARS-Study-35
Report of a Study Conducted by Analytical Reference Service.

Descriptors: (*Chlorine, *Water analysis), Standards, Accuracy.

The chlorination of water supplies accomplishes, in addition to the destruction of microorganisms, a number of other objectives. The reaction of chlorine with compounds such as phenol may result in the production of undesirable taste and odor compounds. If the chlorination is carefully controlled, however, even the latter can be improved. In any case, as a result of chlorination, one of the most commonly performed chemical determinations is the measurement of free available or combined available chlorine in water. At present, there are nine methods for the determination of free and combined chlorine. Unfortunately, none of these have been studied collaboratively. This study was undertaken in an effort to evaluate and prehaps eliminate some of them.

PB-216 570
Public Health Service, Washington, D.C.
REPORT ON POLLUTION OF INTERSTATE WATERS OF THE LOWER COLUMBIA RIVER, BONNEVILLE DAM TO CATHLAMET, WASHINGTON.
Aug 58, 44p

Descriptors: (*Columbia River, *Water pollution), (*Washington (State), Water pollution), (*Oregon, Water pollution).

The report reviews the facts of pollution of the interstate waters of the lower Columbia River between Bonneville Dam and Cathlamet, Washington. The following agencies contributed portions of the assembled material: State of Oregon; State of Washington; City of Portland; City of Vancouver; Fisheries organizations; Industries; and the United States Government.

PB-216 571
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN BOSTON INTRASTATE AIR QUALITY CONTROL REGION.
Dec 68, 75p APTD-1209

Descriptors: (*Massachusetts, *Air pollution).
Identifiers: *Air quality data, *Boston (Massachusetts).

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the Metropolitan Boston, Massachusetts area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-216 572
Oak Ridge National Lab., Tenn.
REPORT OF LABORATORY TESTS, OAK RIDGE NATIONAL LABORATORY SEWAGE,
O. R. Placak, and C. P. Straub. 23 Jun 49, 24p

Descriptors: (*Sewage treatment, *Nuclear physics laboratories).

Laboratory studies were conducted on samples of sewage collected, over a forty-eight hour period, from two manholes in the ORNL Area. These samples were collected for the purpose of determining the solids and biochemical oxygen demand (BOD) characteristics of the sewage and their variation with time. These data are considered essential to the design of sanitary sewage treatment facilities for the ORNL Area. (Author Modified Abstract)

PB-216 573
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PURE AIR FOR PENNSYLVANIA - A JOINT STUDY OF THE EXTENT AND NATURE OF AIR POLLUTION IN PENNSYLVANIA,
David M. Anderson, Jan Lieben, and Victor H. Sussman. Nov 61, 138p SEC-TR-A61-57
Prepared in cooperation with Pennsylvania Department of Health.

Descriptors: (*Air pollution, *Pennsylvania).
Identifiers: *Air quality data.

Basically the study consisted of an analysis of all available air pollution data. The main sources of information concerning community problems were personal visits and interviews with local officials. More than 80 percent of the State's population was covered. The air pollution control officer or the health officer, if any, were the preferred officials for interviewing. All manufacturing industries and public utilities in Pennsylvania employing 100 or more persons were contacted by letter to ascertain industrial air pollution control activities in the State. All available air quality data were assembled and tabulated as concisely as possible. Data on local control activities received special emphasis. Certain technical methods were developed. Photographs were obtained to illustrate some of the more severe problems. (Author Modified Abstract)

PB-216 574
San Antonio River Authority, Tex. Water Quality and Supply Div.
DRYING CHARACTERISTICS OF AEROBICALLY DIGESTED SLUDGE.
Final rept.,
Clifford Randall, and C. Thomas Koch. 10 Sep 68, 68p

Descriptors: (*Sludge drying, *Sewage treatment).

In recent years, activated sludge plants utilizing aerobic digestion for destruction of waste solids have been increasingly used for small installations. If satisfactory operation of the plant is to be maintained, excess sludge must be removed from the digester at regular intervals for ultimate disposal. The principal objective of the project was to determine how an aerobic digester should be operated so that maximum drying rates of the waste sludge on open-air beds can be realized.

PB-216 575
Robert A. Kerr Water Research Center, Ada, Okla.
BUFFALO LAKE PROJECT, RANDALL COUNTY, TEXAS. RESULTS OF A COOPERATIVE WATER QUALITY SURVEY WITH THE TEXAS WATER QUALITY BOARD OF BUFFALO LAKE AND ITS TRIBUTARIES, TIERRA BLANCA CREEK AND FRIO DRAW.
Dec 68, 75p

Descriptors: (*Buffalo Lake, *Water pollution), (*Texas, Water pollution), Reservoirs.
Identifiers: *Water quality data, *Randall County (Texas).

The overall objective of the Buffalo Lake pollution study as was to determine the cause of the recurring pollution of Buffalo Lake. The Texas study assessed the quantity and quality of pollutants discharged by each major waste source and the effect these wastes have on the water quality of the receiving stream and Buffalo Lake.

PB-216 576
Northwest Shellfish Sanitation Lab., Gig Harbor, Wash.
PROCEEDINGS OF NORTHWEST SHELLFISH SANITATION RESEARCH PLANNING CONFERENCE (1964).
Environmental health series: Food protection,
W. J. Beck, J. C. Hoff, and T. H. Ericksen. 1965, 100p PHS-Pub-999-FP-4

Descriptors: (*Food sanitation, *Shellfish), (*Water pollution, Shellfish), Seafood, Sewage, Bacteriology, Virology, Food processing, Food storage, Food industry, Public health, Proceedings, Meetings, Oysters, Clams.

Contents:
- A study of the applicability of several indices as sanitary quality indicators in commercially packed pacific oysters;
- Effect of anitfoaming agents and evacuation on shellfish homogenization;
- Activities of public health service research centers;
- Brief hydrographic survey of Burley Lagoon, Washington;
- Bacteriological study of stored Pacific oyster shellstock;
- Storage studies on Manila clams (Tapes japonica) and Native Littleneck clams (Protothaca staminea) shellstock;
- Studies on depuration-induced changes in the composition of the Pacific oyster (Crassostrea gigas);
- Studies on the behavior of a bacteriophage in the Pacific oyster (Crassostrea gigas);
- Proposed research activities for fiscal year 1965.

PB-216 577
Office of Education, Washington, D. C. Children's Bureau.
THE STRUGGLE FOR CLEAN WATER. AN INTRODUCTION TO WATER POLLUTION AS A PROBLEM IN CONSERVATION, HEALTH, AND WATER RESOURCES MANAGEMENT.
1962, 24p PHS-Pub-958
Pub. in 'Today's Health Problems', a series for teachers, no. 1.

Descriptors: (*Water pollution, Reviews).

The publication discusses causes and effects of water pollution, the technology of water pollution, and a program to abate water pollution.

PB-216 578
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SEWER CONSTRUCTION COST INDEX. CONSTRUCTION COST TRENDS. MUNICIPAL SEWERS.
1964, 32p PHS-Pub-1132

Descriptors: (*Sewers, *Construction costs), Indexes (Ratios).

The index, utilizing known quantities of labor and materials properly proportioned, has the advantage of being its own test for the base period. Because it has a fixed base, periodic surveys can be made to test whether or not the fixed base still reflects sewer construction practice. This method provides a yardstick to study the trends and magnitude of sewer project construction costs in constant dollar values. The two indexes--the Sewage Treatment Plant Construction Cost Index (PHS-STP) and the Sewer Construction Cost Index (PHS-S)-- when used in conjunction, provide the tools necessary to equate sewerage projects, one to another, in both time and place.

PB-216 579
Public Health Service, Washington, D.C. Bureau of State Services.
CONTROL OF RADON AND DAUGHTERS IN URANIUM MINES AND CALCULATIONS ON BIOLOGIC EFFECTS,
Duncan A. Holaday, David E. Rushing, Richard D. Coleman, Paul F. Woolrich, and Howard L. Kusnetz. 1950, 93p PHS-Pub-494

Descriptors: (*Industrial medicine, *Radon), (*Radioactive isotopes, Industrial medicine).
Identifiers: *Uranium mining, *Mine safety.

A steadily mounting rate of uranium production has focused increasing attention on the health hazards associated with the mining of this strategic metal. Predominant among these hazards is exposure to radon, a dense gas emanating from the ore, together with the products which result from the radioactive decay of radon. To date, neither records of human exposure to radon daughter products nor data from animal experimentation have been available in sufficient quantity to permit a determination of a maximum permissible concentration for these elements. It has therefore been necessary to establish a working level which appears to be safe, yet not unnecessarily restrictive to industrial operations. Such a level, it is believed, has been established and recommended in the report. (Author Modified Abstract)

PB-216 580
California Inst. of Tech., Pasadena.
STUDY OF THE PROPERTIES OF AEROSOLS, WITH PARTICULAR REFERENCE TO THE NATURE OF THE AIR-PARTICLE INTERFACE.
Final rept.,
Alexander Goetz. 31 Aug 58, 96p SEC-TR-A58-10
Contract SAph-69557

Descriptors: (*Aerosols, *Particle size distribution), (*Samplers, Particle size distribution), (*Particles, *Air pollution), Public health.

In 1956 the first successful prototype of an Aerosol Spectrometer was built and used subsequently for the size analysis of synthetic and natural smog. A significantly improved type was available during the period of this contract. Its performance has been studied - particularly with regard to the possibility of tracing with it associated states between gas components and air-borne particles. This subject forms Part A of the report. The Bacteriological Irritation Analogue (BIA) test, its instrumentation and application is described in Part B. Attached to the report is an Appendix, containing a theoretical analysis and interpretation of recent animal tests in synergistic aerosols. (Author Modified Abstract)

PB-216 581
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
BIG SIOUX RIVER DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
Oct 51, 50p PHS-WPS-21 PHS-Pub-127
Prepared in cooperation with Iowa Dept. of Health, Minnesota Dept. of Health, South Dakota Dept. of Health.

Descriptors: (*Big Sioux River Basin, *Water pollution), (*Iowa, Water pollution), (*Minnesota, Water pollution), (*South Dakota, Water pollution).

The Big Sioux Basin, located in eastern South Dakota, northwestern Iowa, and southwestern Minnesota, is a rich agricultural area whose residents depend almost entirely upon agriculture and associated industries for a livelihood. The report presents information about water use of the area, pollution entering those water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures now in effect and those which appear to be needed.

PB-216 582
Joint District, Federal and State Project for the Evaluation of Refinery Emissions.
EMISSIONS OF HYDROCARBONS TO THE ATMOSPHERE FROM SEALS ON PUMPS AND COMPRESSORS,
Bernard J. Steigerwald. Apr 58, 37p 6

Descriptors: (*Refineries, Air pollution), (*Petroleum refining, Air pollution), (*Air pollution, *Hydrocarbons), (*California, Air pollution), Industrial wastes, Pumps, Seals, Compressors.
Identifiers: *Los Angeles County (California).

One phase of the Joint District, Federal and State Project for the Evaluation of Refinery Emissions was the study of hydrocarbon leakage from seals on pumps and compressors. The report details the techniques and conclusions of the study. Using the census data, pumps were classified into 27 unique combinations of pump type, seal type, product and pump operation. Approximately 15 per cent of the seals in each group were checked. A total of 473 pump seals were inspected and these had an average loss of 4.2 pounds of hydrocarbons per day. This average loss is based on emissions from 75 measured leaks and loss estimates for 95 small leaks. All compressor seals were tested. These lost an average of 8.5 pounds per day per seal. The hydrocarbon leakage from pump seals is given. (Author Modified Abstract)

PB-216 584
Bureau of Solid Waste Management, Cincinnati, Ohio.
ANALYSIS OF SOLID WASTE COMPOSITION. STATISTICAL TECHNIQUE TO DETERMINE SAMPLE SIZE,
Dennis E. Carruth, and Albert J. Klee. 1969, 28p BSWM-SW-19ts

Descriptors: (*Waste disposal, *Samples), Sampling, Statistical analysis.
Identifiers: *Solid waste disposal.

The work analyzes data obtained after separating and weighing solid waste and presents a statistical technique to determine the minimum weight and number of samples needed to realistically and reliably estimate the characteristics of a given quantity of solid waste. Samples of solid waste of varying weights were taken and separated into nine components; each component was weighed, and the data were then statistically evaluated. It was determined that there is no significant variance among sample weight groups. The study recommends that 12, relatively small (200-lb) samples will validly reflect the composition of a given supply of solid waste. (Author)

PB-216 585
Bureau of Solid Waste Management, Rockville, Md.
SOLVING THE ABANDONED VEHICLE PROBLEM IN SMALL COMMUNITIES,
William T. Dehn. 1970, 32p BSWM-Open File Rept-To-5.5/0

Descriptors: (*Waste disposal, *Automobiles), (*Oregon, Waste disposal), (*Wyoming, Waste disposal).
Identifiers: *Junk car disposal, *Solid waste disposal, Newcastle (Wyoming), Klamath County (Oregon).

The small community faces serious problems in dealing with an eliminating abandoned vehicles. In this report, two case studies are presented which describe the cleanup efforts of two small communities--Newcastle, Wyoming and Klamath County, Oregon. (Author Modified Abstract)

PB-216 586
Bureau of Solid Waste Management, Cincinnati, Ohio.
A REPORT ON THE DEKALB COUNTY INCINERATOR STUDY,
Leland E. Daniels. 1970, 74p BSWM-SW-31ts

Descriptors: (*Waste disposal, *Incinerators), (*Georgia, Waste disposal), Air pollution, Performance evaluation.
Identifiers: *Solid waste disposal, *DeKalb County (Georgia).

On October 28, 1968, the DeKalb County, Georgia, Department of Public Health, requested assistance from the Bureau of Solid Waste Management in solving the problem of excess particulate emissions from the DeKalb County incinerator. A field study of the incinerator was conducted from December 11 to 13, 1968, to determine the potential level of pollution resulting from the solid, liquid, and gaseous effluents from the incinerator. The results of this study are presented.

PB-216 587
Bureau of Solid Waste Management, Rockville, Md.
SOLID WASTE MANAGEMENT PRACTICES IN A PLASTICS PRODUCTION PLANT,
William T. Dehn, and Dennis E. Carruth. 1970, 39p BSWM-Open File Rept-TO-5.0/0

Descriptors: (*Waste disposal, *Plastic industry).
Identifiers: *Solid waste disposal.

A study of solid waste generation, storage, collection, and disposal was conducted at a plastics production plant during the fall of 1968. A study team observed the normal solid waste management practices within the plant during one week. Additional data and information, unavailable during the field study, were obtained through written request to the company. The solid wastes were categorized as either process waste or nonprocess waste. (Author)

PB-216 588
Bureau of Solid Waste Management, Cincinnati, Ohio.
REPORT ON A STUDY OF THE ALEXANDRIA, VIRGINIA INCINERATOR,
Tobias A. Hegdahl. 1970, 53p BSWM-SW-12ts

Descriptors: (*Waste disposal, *Incinerators), (*Virginia, Waste disposal), Performance evaluation.
Identifiers: *Solid waste disposal, *Alexandria (Virginia).

In October 1967, the Solid Waste Management Representative, Bureau of Solid Waste Management was contacted by the City of Alexandria, Virginia, regarding the possibility of having their incinerator tested. The city was interested in finding out if recently made changes in furnace operation had affected particulate emissions. Since the stack-emission tests had been conducted in April 1967, before the changes in operation were made, a direct comparison would be possible. A study was conducted from May 18 to 25, 1968.

PB-216 589
Northwest Shellfish Sanitation Lab., Gig Harbor, Wash.
PROCEEDINGS OF NORTHWEST SHELLFISH SANITATION RESEARCH PLANNING CONFERENCE (1965).
Environmental health series: Food protection, W. J. Beck, and J. C. Hoff. 1966, 118p PHS-Pub-999-FP-6

Descriptors: (*Food sanitation, *Shellfish), (*Water pollution, Shellfish), Estuaries, Filtration, Antiinfectives and antibacterials, Clostridium botulinum, Seafood, Sewage, Bacteriology, Virology, Food processing, Clams, Oysters, Proceedings, Meetings, Food storage, Food industry, Public health.

Contents:
- Membrane filter technics as applied to estuarine and tributary waters;
- Bacteriological studies on commercial processing of Olympia oysters (Ostrea lurida);
- Storage studies on shucked olympia oysters (Ostrea lurida);
- Storage studies on olympia oyster shellstock (Ostrea lurida);
- Antimicrobial agents in West Coast shellfish;
- Research activities at other Public Health Service Shellfish Sanitation Centers;
- Preliminary ecological studies on the presence of Clostridium botulinum;
- Incidence of Clostridium botulinum on the Pacific coast;
- Depuration of Poliovirus polluted clams;
- Studies on bacteriophage accumulation and elimination by the Pacific oyster (Crassostrea gigas);
- Studies on membrane filtration of bacteriophage;
- Proposed research activities for fiscal year 1966.

PB-216 590
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
FISH POISONING: A PROBLEM IN FOOD TOXICATION,
Alfred F. Bartsch, and Earl F. McFarren. 1960, 34p
Presented at the Milk and Food Sanitation Session of the Laboratory Section held in Cincinnati, Ohio, on 2 Nov 60.

Descriptors: (*Fishes, *Toxicity), (*Food poisoning, Fishes), (*Seafood, Food poisoning), Public health, Poisons, Distribution (Property), Identifying, Shellfish.
Identifiers: *Poisonous fishes.

Some marine organisms are dangerous because of their venomous stings or bites, while others are poisonous to eat. Among the latter are shellfish of several kinds, including mussels, clams, and oysters. Some fin fishes also are poisonous to eat. They are intrinsically poisonous and, like the toxic shellfish, do not produce their undesirable effects through bacterial spoilage. Such fishes are the subject of this paper.

PB-216 591
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE JOINT CITY, COUNTY, STATE, AND FEDERAL STUDY AIR POLLUTION IN LOUISVILLE, KENTUCKY,
August T. Rossano, Jr. 1956, 10p
Presented at the Annual Meeting of the Air Pollution Control Association (49th), held at Buffalo, N. Y., on 21 May 56.

Descriptors: (*Kentucky, *Air pollution).
Identifiers: *Louisville (Kentucky).

The paper describes the planning and development of a cooperative study of air pollution in Louisville, Kentucky. The study, initiated January, 1956, is sponsored by the Jefferson County Air Pollution Control District under the technical

direction of the Public Health Service in cooperation with the City-County Board of Health, the State Department of Health, the U.S. Bureau of Mines, and the U.S. Weather Bureau, and the National Bureau of Standards and with financial support from the industries of Louisville. Outlined in this paper is the plan of study which includes an inventory of air pollution sources, an odor survey, continuous air sampling, meteorological coverage, and other related activities. (Author)

PB-216 592
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A CONTINUOUS AUTOMATIC AIR SAMPLER FOR THE DETERMINATION OF RADON AND THORON,
G. I. Coates. 1960, 14p
Presented at the Health Physics Society Meeting held in Boston, Mass., on 29 Jun-1 Jul 60.

Descriptors: (*Radiation measuring instruments, *Gas sampling), (*Air pollution, Radioactive contaminants), Design, Radon, Thoron.
Identifiers: *Air pollution detection.

An instrument is required to measure continuously environmental levels of airborne radon and thoron as well as beta activity and long-lived alpha emitters. The report describes an instrument which achieves these requirements by filtering air through a membrane filter in a step wise manner continuously observing the deposited alpha activity of the radon and thoron daughter products. This observed activity is theoretically related to the airborne gaseous radon and thoron. (Author Modified Abstract)

PB-216 593
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SYNOPTIC CLIMATOLOGY OF STAGNATING ANTICYCLONES EAST OF THE ROCKY MOUNTAINS IN THE UNITED STATES FOR THE PERIOD 1936-1956.
Technical rept.,
Julius Korshover. 1960, 17p SEC-TR-A60-7
Prepared in cooperation with the Weather Bureau, Washington, D.C. Office of Meteorological Research. Revision of report dated Nov 59.

Descriptors: (*Climatology, *Anticyclones), (*Synoptic meteorology, Anticyclones).

The purpose of the study is to define the synoptic climatology of stagnating high pressure systems in the eastern part of the United States. As a first step, it is necessary to make a survey of the location and frequency of occurrence of stagnating anticyclones in the area. In recent years, due to an increase in urban living, the air pollution problem has become more and more aggravating and has attracted considerable attention. Our gradually increasing population and the concentration of heavy industries in relatively congested areas of population indicate the need for an investigation of the synoptic climatology of this phenomenon with a view to preventing its harmful effects upon human life in the future. (Author Modified Abstract)

PB-216 594
National Center for Radiological Health, Rockville, Md.
RADIOLOGICAL HEALTH RESEACH.
Summary rept., Jul 65-Dec 66.
1966, 129P PHS-Pub-1672

Descriptors: (*Radiobiology, Research), (*Public health, Radiobiology), Radiation hazards, Radiation injuries, Cytology, Biophysics, Radiation effects, Epidemiology, Ecology, Radioactive isotopes.
Identifiers: Oncology.

Contents:
Research Branch, its place in the Division;
Basic investigations;
Twinbrook Laboratory;
Robert A. Taft Sanitary Engineering Center;
Southeastern Radiological Health Laboratory;
Northeastern Radiological Health Laboratory;
Southwestern Radiological Health Laboratory;
Biophysical indicators of radiation damage;
Cytogenetic consequences of radiation exposure;
Radiation physics;
Radiation oncology and pathology;
Collaborative Radiological Health Laboratory;
Radionuclide metabolism program.

PB-216 643
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ULTIMATE DISPOSAL OF WASTE WATER. 1. A PHILOSOPHICAL VIEW. 2. ULTIMATE DISPOSAL OF WASTE WATER CONCENTRATES TO THE ENVIRONMENT,
Robert B. Dean. 1969, 12p
Pub. in Chemical Engineering Progress Symposium Series, v65 n97 p1-4 1969 and Environmental Science and Technology, v2 n12 p1079-1086 Dec 68.

Descriptors: (*Waste disposal, *Pollution).

The report discusses the various possibilities for ultimate disposal of wastes, briefly evaluating each. The paper discusses methods of removing minerals and nutrients from wastewater and the ultimate disposal of the waste concentrates produced.

PB-216 644
Joint District, Federal and State Project for the Evaluation of Refinery Emissions.
ATMOSPHERIC EMISSIONS FROM CATALYTIC CRACKING UNIT REGENERATOR STACKS,
Victor H. Sussman. Jun 57, 60p 4

Descriptors: (*Refineries, Air pollution), (*Petroleum refining, Air pollution), (*Catalytic cracking, Air pollution), (*Air pollution, *Industrial wastes), (*California, Air pollution), Atmospheric composition, Gas sampling.
Identifiers: *Los Angeles County (California).

The refineries in Los Angeles County operate six Fluid Catalytic Cracking Units, nine Thermofor Catalytic Cracking Units, and one Thermofor Catalytic Reforming Unit. These units process approximately 241,000 BPD of petroleum distillate. The atmospheric effluents from the regenerator stacks of these units were tested. Individual and total emission rates from these stacks are presented along with details of the sampling techniques and analytical methods used to obtain these data. The total emission rates from the regenerator stacks of the Thermofor and Fluid Catalytic Cracking Units (excluding the TCR Unit) were found.

PB-216 645
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ULTRAMICRO DETECTION OF BENZO (A)PYRENE IN THE AIR,
Eugene Sawicki, Thomas Stanley, Thomas Hauser, and Roger Barry. 1957, 19p

Descriptors: (*Pyrenes, *Gas analysis), Carcinogens.
Identifiers: *Benzopyrenes, *Air pollution detection.

Identification of benzo (a)pyrene in the aromatic fractions from air, tobacco smokes, tars, etc., has been based on one or two of the following seven considerations. The authors would like to add four additional identification methods which we have found to be of value in air pollution investigations.

PB-216 646
Oak Ridge National Lab., Tenn.
PRELIMINARY REPORTS OF PROGRESS - EXPERIMENTAL WATER TREATMENT PLANT II. OPERATING RESULTS, 18-28 JULY 1949,
Conrad P. Straub, Thomas R. Ostrom, and K. Stanley Lyle. 16 Aug 49, 9p

Descriptors: (*Water treatment, Performance evaluation).

Before studies on the removal of radioactive materials by the experimental water treatment plant were initiated, it was felt desirable to obtain information relative to the efficiency of the plant in treating raw waters. To obtain these data, a treatment plant was in continuous operation for the period July 18-20 and July 25-28, 1949. During these intervals, turbid waters were treated with alum and alkali, passed through the coagulation and sedimentation chambers, and filtered. Hourly samples were collected of the raw, mixed, settled, and filtered waters, and the pH, turbidity, and alkalinity were determined.

PB-216 647
Federal Water Pollution Control Administration, Cincinnati, Ohio.
ADVANCED WASTE TREATMENT RESEARCH PROGRAM, JULY 1964-JULY 1967.
Water Pollution control research series. Summary Report.
1968, 103P WP-20-AWTR-19
See also report dated 15 Dec 65, PB-168 837.

Descriptors: (*Sewage treatment, *Chemical removal (Sewage treatment)).
Identifiers: *Physical chemical treatment.

The report summarizes results of advanced waste-treatment studies from July 1964 to July 1967. Under a combined program of contract and intramural research, a wide range of wastewater-treatment processes have been evaluated for technical and economic feasibility at stages of development from laboratory-scale through pilot-scale. These treatment methods include processes for suspended solids removal, organic removal, inorganic removal, nutrient removal, and ultimate disposal of concentrated end products. (Author Modified Abstract)

PB-216 648
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE ADVANCED WASTE TREATMENT RESEARCH PROGRAM, JUNE 1960--DECEMBER 1961.
Summary rept.

May 62, 69p SEC-TR-W62-9
See also report dated 15 Dec 65, PB-168 837.

Descriptors: (*Sewage treatment, *Chemical removal (Sewage treatment)).
Identifiers: *Physical chemical treatment, *Water pollution control.

The report discusses the contaminants of challenge to advanced waste treatment processes and the damage to water quality that result from their presence in our lake, our rivers, and our tap waters. The contaminants discussed are those resistant to or even totally unaffected by today's best conventional water and waste treatment processes, i.e., refractory contaminants. (Author Modified Abstract)

PB-216 649
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Cincinnati Water Research Lab.
SANITARY SIGNIFICANCE OF FECAL COLIFORMS IN THE ENVIRONMENT.
Water pollution control research series,
E. E. Geldreich. Nov 66, 117p WP-20-3

Descriptors: (*Coliform bacteria, *Reviews), (*Water pollution, Coliform bacterial), (*Water analysis, Coliform bacteria), (*Indicator species, Coliform bacteria).
Identifiers: *Water pollution detection.

The compilation of previously published papers by personnel of the Microbiological Activities, Basic and Applied Sciences Program, Cincinnati Water Research Laboratory, (Robert A. Taft Sanitary Engineering Center), brings together in one volume much of the information concerning fecal-coliform bacteria that has appeared in various scientific journals. The material is organized into seven chapters that include background; methodology; and occurrences in warm-blooded animals including man; fresh-water fish; vegetation and insects; and soil. The final section covers the intrepretation and significance of fecal-coliform bacteria in water pollution studies. (Author)

PB-216 650
Stanford Univ., Calif. Program in Engineering-Economic Planning.
EFFECTS OF WATER POLLUTION IN SAN FRANCISCO BAY,
Gene E. Willeke. Oct 68, 164p EEP-29
Grant FWPCA-WP-01194-01

Descriptors: (*Water pollution, *Attitude surveys), (*Public opinion, Water pollution), (*California, Water pollution), (*San Francisco Bay, Water pollution).

Collecting information on individual perceptions and judgment standards of San Francisco Bay requires direct contact with individuals. The report presents a survey of a representative sample of adults conducted in the nine Bay Area counties during September-October, 1967.

PB-216 651
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
FRENCH CREEK STUDY. REPORT ON LOW FLOW REQUIREMENTS IN FRENCH CREEK BELOW MEADVILLE, PENNSYLVANIA.
Jan 59, 53p
Prepared in cooperation with the District Engineer, Pittsburgh District, The Pennsylvania Dept. of Health, and the City of Meadville, Pa.

Descriptors: (*French Creek, *Water pollution), (*Pennsylvania, Water pollution).
Identifiers: *Water quality data, *Crawford County (Pennsylvania).

In August, 1955 the U. S. Public Health Service, the Pennsylvania Department of Health, the City of Meadville, Pennsylvania, and the Corps of Engineers, U. S. Army, cooperated in a survey on French Creek. Principal objectives of the survey were as follows: To determine the present chemical, physical, and biological quality of the stream, to determine the nature, volume, and strength of the major waste loads discharged to the stream in the Meadville area, to estimate the deoxygenation and reoxygenation characteristics of the stream and thereby determine the ability of the stream to assimilate pollution loads, and to predict the effect of a future increase in waste load on the oxygen resources of the stream as a result of possible population increases and/or industrial expansion. (Author Modified Abstract)

PB-216 652
Massachusetts Univ., Amherst. Environmental Engineering.
SLUDGE DEWATERING BY CENTRIFUGATION.
Research rept.,
Donald L. Ray, John H. Nebiker, and Donald Dean Adrian. Sep 68, 81p EVE-11-68-5, RR-2
Grant FWPCA-01239-02

Descriptors: (*Sludge disposal, Dewatering), (*Dewatering, *Centifugal filtration), Design, Performance evaluation.
Identifiers: Sludge treatment.

The purpose of the paper is to review the state of the art regarding centrifugal dewatering of wastewater sludges, and to indicate proper selection and operation of centrifuges.

PB-216 653
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
SOLID WASTE PROCESSING. A STATE-OF-THE-ART REPORT ON UNIT OPERATIONS AND PROCESSES,
Richard B. Engdahl. 1969, 77p BSWM-SW-4c, PHS-Pub-1856
Contract PH-86-66-160
Library of Congress card no. 70-602720.
Paper copy available from GPO $0.75, as stock no. HE20.1102:304.

Descriptors: (*Waste disposal, *Bibliographies), Separation, Earth fills, Incinerators, Waste treatment, Utilization, Materials recovery.
Identifiers: *Solid waste disposal, Waste recycling.

The importance and intricacy of the solid wastes disposal problem and the need to deal with it effectively and economically led to the state-of-the-art survey covered by this report. The report is divided into two major parts: Unit Operations and Processes and Major Waste Categories. The first part of the report is divided into six sections: Densification and Size Reduction, Separation, Sanitary Landfill and Open Dumping, Incineration, Chemical Processing, and Recovery and Utilization. This first part of the report also includes various regulations concerning solid waste disposal, discussion being based on responses to the questionnaires sent to the State health departments. The second part of the report, arranged alphabetically, covers all the major waste categories considered. The report concludes with a bibliography.

PB-216 654
National Research Council, Washington, D.C. Committees on Pollution Abatement and Control.
POLICIES FOR SOLID WASTE MANAGEMENT.

1970, 79p BSWM-SW-11c, PHS-2018
Contract PH-86-67-240
Library of Congress Catalog Card no. 77-606275.
Paper copy available from GPO $0.50 as HE20.1402:P:75.

Descriptors: (*Waste disposal, Management planning).
Identifiers: *Solid waste disposal.

The report deals with the management of solid wastes. Solid wastes are significantly different from air and water pollutants and require unique environmental-control measures. In preparing the report, the Committee has attempted to evaluate the problems and place them in proper perspective. An attempt has been made to outline an action program based on problem definition, a study of need, a study of constraints, and an analysis of engineering requirements and alternatives. No attempt has been made to cover the entire spectrum of solid wastes; rather, attention is directed to the urban-generated portion and its resulting urban-centered problems, and to some effects of related agricultural, industrial, and commercial activity. (Author Modified Abstract)

PB-216 655
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SOURCE MATERIALS ON WATER POLLUTION CONTROL,
Carl E. Schwob. 27 Aug 52, 26p PHS-Pub-243

Descriptors: (*Water pollution, *Bibliographies).

The bibliography on water pollution includes in following topics: General information and background, Community action, Financing and economic factors, Laws and regulations, Industrial wastes, Domestic wastes, Research and standards, Biological aspects of water pollution, Water resources, Films.

PB-216 656
Columbia Univ., New York. Dept. of Industrial Engineering.
TABLES OF THE PROBABILITY AND DENSITY FUNCTIONS FOR THE BIVARIATE EXTREMAL DISTRIBUTIONS,
E. J. Bumbel, C. K. Mustafi, and Orvel E. Smith.
1 Apr 68, 263p
Grant FWPCA-WP-00457, NSF-GK-695
Prepared in cooperation with National Aeronautics and Space Administration, Huntsville, Ala. Aero-Astrodynamics Lab.

Descriptors: (*Stream flow, Predictions), (*Bivariate analysis, Tables (Data)), Numerical analysis.

The floods of the Fox River were analyzed with the aid of probability density functions at two stations, namely, Berlin, Wisconsin (upstream) and Wrightstown, Wisconsin (downstream). From this data a distribution was found. Suppose we are interested to know how severe a flood has to be to cause a discharge of 20,000 c.f.s. (cubic feet per second) at Wrightstown and a discharge of 6,000 c.f.s. at Berlin. Denoting by X and Y the reduced values of the floods at upstream and downstream respectively, the authors can compute this. Most of the report is made of tables of probability and density functions for bivariate extremal distributions.

PB-216 657
Public Health Service, Washington, D. C. Div. of Dental Health.
BETTER HEALTH FOR 5 TO 14 CENTS A YEAR THROUGH FLUORIDATED WATER.
Feb 51, 20p PHS-Pub-62

Descriptors: (*Fluoridation, *Water treatment), (*Public health, Fluoridation).

The report proposes the fluoridation of water supplies to reduce dental decay and improve the health of children. It gives the benefits and costs of such a program and describes methods of implementation. Included is a list of cities with fluoridated water supplies.

PB-216 658
Federal Water Pollution Control Administration, Edison, N. J. North Atlantic Water Quality Management Center.
OIL AND HAZARDOUS MATERIALS. EMERGENCY PROCEDURES IN THE WATER ENVIRONMENT.
Oct 68, 140p CWR-10-1

Descriptors: (*Hazardous materials, Properties), (*Water pollution, Hazardous materials), Cargo transportation, Flammability, Explosions, Toxicology.
Identifiers: Contingency plans, *Hazardous materials transportation, Oil pollution.

Very large amounts of petroleum and chemical products are shipped in bulk via waterways and by rail, truck and pipeline. The number and quantity of these materials is steadily increasing as industrial needs expand and advances are made in transportation technology. Spills and other accidental discharges of such products can seriously impair water uses proximate or remote from the source of discharge. The purpose of this manual is to provide basic information on the characteristics and the effects of the pollutants and procedures to be followed in the event of a significant release of oil

or other hazardous materials to the water environment. This booklet initially covers about 50 petroleum products and chemicals shipped in bulk. (Author Modified Abstract)

PB-216 659
Public Health Service, Kansas City, Mo. Region VI.
MAIN STEM RESERVOIR EFFECTS ON WATER QUALITY IN THE CENTRAL MISSOURI RIVER 1952-1957,
Joe Kendall Neel, H. P. Nicholson, and Allan Hirsch. Mar 63, 157p

Descriptors: (*Missouri River, *Water pollution), (*Reservoirs, Missouri River), (*North Dakota, Water pollution), (*South Dakota, Water pollution), (*Nebraska, Water pollution), Garrison Reservoir, Oahe Reservoir, Fort Randall Reservoir, Gavins Point Reservoir.
Identifiers: *Water quality data.

The investigation from 1952 to 1957 disclosed water quality changes wrought by early impoundment in main stem reservoirs on the Central Missouri River. These huge impoundments markedly altered discharge regimens, reduced turbidity, changed water chemistry, and promoted growth of phytoplankton which also modified water chemistry. The Public Health Service evaluated limnological modifications and developments inherent in the presence and varied operation of these reservoirs.

PB-216 660
Connecticut Univ., Storrs. Dept. of Chemical Engineering.
AUTOMATIC CONTROL OF A COMPLETELY MIXED ACTIVATED SLUDGE REACTOR.
Progress rept. 1 Feb 68-15 Jun 69,
Herbert E. Klei. 16 Jun 69, 220p
Grants WPD-175-02-67, WPD-175-01-67

Descriptors: (*Activated sludge process, *Mixing), (*Sewage treatment, Activated sludge process), Mathematical models, Reaction kinetics, Performance evaluation.

The report is presented as four separate research papers on the several phases of the grant: A Study of the Reaction Kinetics of a Completely Mixed Activated Sludge Reactor; The Effect of Changes in pH on the Performance of a Completely Mixed Activated Sludge Reactor; Determination of Mixing in a Gas Sparged Reactor; and Response and Stability of a Completely Mixed Activated Sludge Reactor.

PB-216 661
Environmental Health Center, Cincinnati, Ohio.
MISSOURI RIVER BASIN PLANKTON STUDY, 1950,
Kenneth E. Damann. Aug 51, 115p
Report of the Plankton Survey made in the Missouri River Basin during July, August, and September 1950.

Descriptors: (*Missouri River Basin, *Plankton), (*Water pollution, Missouri River Basin).
Identifiers: *Water quality data.

A plankton reconnaissance was made in the Missouri River Basin during the summer of 1950. The total distance covered was over 6,000 miles extending along the Missouri River, its tributaries, and associated waters in Missouri, Kansas, Nebraska, Iowa, South Dakota, North Dakota, Montana, and Wyoming. (Author)

PB-216 662
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A SURVEY OF AIR POLLUTION IN COMMUNITIES AROUND THE JOHN F. KENNEDY INTERNATIONAL AIRPORT, SEPTEMBER-OCTOBER 1964,
Melvin Nolan. Jun 66, 81p

Descriptors: (*Air pollution, *New York), (*Airports, Air pollution), Exhaust gases.
Identifiers: John F. Kennedy Airport, *Queens County (New York), *Nassau County (New York).

A 1-month air-quality study was conducted in the communities adjacent to John F. Kennedy Airport in Queens and Nassau Counties, New York, from September 24 to October 24, 1964. To evaluate the air pollution problem in these communities, especially problems attributable to aircraft operations, eight sampling stations were located in the area. Atmospheric particulate samples were collected at six sampling stations, total atmospheric gaseous hydrocarbon samples, at one, and meteorological measurements were obtained at another station. An odor survey was also conducted as was meteorological data. A questionnaire seeking opinions and experiences relating to air pollution conditions in the vicinity of airports serving other large cities is presented.

PB-216 663
Bureau of Solid Waste Management, Cincinnati, Ohio.
PROPOSALS FOR A REFUSE DISPOSAL SYSTEM IN OAKLAND COUNTY, MICHIGAN.
Final rept.

1970, 155P BSWM-SW-7d PHS-Pub-1960
Grant PHS-UI-00068
Library of Congress Catalog Card no. 79-607-050.
Paper copy available from GPO $1.25 as HE20.1402:0A4.

Descriptors: (*Michigan, Waste disposal), (*Waste disposal, *Regional planning).
Identifiers: *Solid waste disposal, *Oakland County (Michigan).

The work presented results from a thorough study of the refuse disposal problems of Oakland County. The investigation explored secondary transportation; incineration; residue disposal; rural problems; legal, financial and public relations aspects of the problem; and an investigation of cooperative endeavors with Wayne and Macomb Counties. (Author)

PB-216 665
Federal Water Pollution Control Administration, College, Alaska. Alaska Water Lab.
ECOLOGICAL CHANGES IN THE CHENA RIVER,
Paul J. Frey. Apr 69, 46p

Descriptors: (*Chena River, *Ecology), (*Alaska, Water pollution), (*Water pollution, Chena River).

Information on various water quality parameters in the river was discovered which suggested that conditions in the river had changed considerably during the past 10 to 15 years. As the study progressed, additional information led to side excursions in search of further information on past conditions of the river and economical practices which may have caused those conditions. Those excursions form the basis for the report.

PB-216 666
Federal Water Quality Administration, Washington, D. C. Training Program.
ANALYSIS AND CONTROL OF THERMAL POLLUTION: TRAINING MANUAL.
Clean water rept.
Aug 70, 208p

Descriptors: (*Water pollution, Heat), Manuals, Education.
Identifiers: *Thermal pollution.

Contents: Introduction; Thermal effects; Biological effects on fish; Thermal sources; Measurement and evaluation; and Control methods.

PB-216 667
Maxwell Graduate School of Citizenship and Public Affairs, Syracuse, N.Y.
HOUSING CODE ADMINISTRATION AND ENFORCEMENT.
Community Environmental Management series,
Spencer Parratt. 1970, 188p PHS-Pub-1999

Descriptors: (*Residential buildings, Standards), (*Government policies, Residential buildings), National government, Regulations, Law enforcement.
Identifiers: *Housing codes.

The manuscript is designed for use by persons concerned with enforcement of housing codes and will stimulate the development of new approaches to enforcement.

PB-216 668
Joint District, Federal and State Project for the Evaluation of Refinery Emissions.
EMISSIONS TO THE ATMOSPHERE FROM EIGHT MISCELLANEOUS SOURCES IN OIL REFINERIES.

Jun 58, 57p 8

Descriptors: (*Refineries, Air pollution), (*Petroleum refining, Air pollution), (*Air pollution, *Hydrocarbons), (*California, Air pollution).
Identifiers: *Los Angeles County (California).

The report details the techniques and results of Joint Project studies of atmospheric emissions from eight miscellaneous sources in oil refineries. Because the emissions from these operations or equipment were of a minor nature or were already well defined and understood through previous available studies, independent field testing was carried out in only one of the eight source studies. The estimates of emissions presented were generally based on field inspections, letter surveys, literature surveys, and existing test data or loss estimates supplied by the Los Angeles County Air Pollution Control District or the Western Oil and Gas Association. (Author)

PB-216 669
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN BILLINGS INTRASTATE AIR QUALITY CONTROL REGION (MONTANA).

Aug 70, 53p APTD-1202

Descriptors: (*Air pollution, *Montana).
Identifiers: *Billings (Montana), *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the Billings, Montana area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-216 670
Little (Arthur D.), Inc., Cambridge, Mass.
ECONOMIC INCENTIVES IN WATER QUALITY MANAGEMENT.
Final rept. on Phase I.

Dec 70, 223p

Descriptors: (*Vermont, *Water pollution), (*Taxes, Water pollution), (*Industrial wastes, Taxes).

Identifiers: *Water pollution abatement, *Water pollution taxes (Charges).

Contents: A general review and assessment of effluent charge methods; Effluent charge rationales; Criteria for evaluating effluent charge methods; Note on the legislative background in Vermont); A method, structure and schedule for Vermont, Selection of a charge structure, Approaches to a charge schedule); Administrative procedures (Approaches to permit status determination, initial information system design, preliminary note on computerized modeling for subsequent status determination and other operational purposes).

PB-216 671
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
RECONNAISSANCE, ECONOMIC BASE ANALYSIS AND FORECAST, GRANDE RONDE RIVER BASIN, UNION COUNTY, OREGON.

Apr 61, 12p Working Paper-1
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Grande Ronde River Basin, *Economic forecasts), (*Oregon, Economic forecasts), River basin development.
Identifiers: *Union County (Oregon).

The survey is for the purpose of providing basic data about the economy of the Grande Ronde River Basin. This data will be utilized in the preparation of the water supply and pollution control recommendations of the U. S. Public Health Service for the Grande Ronde River. For the purpose of this survey, the study area has been defined as Union County, Oregon, and its major communities. The study period is the 50-year period ending in 2010. (Author Mofified Abstract)

PB-216 672
Oak Ridge National Lab., Tenn.
REPORT OF LABORATORY TESTS. OAK RIDGE NATIONAL LABORATORY SEWAGE. EFFECT OF SETTLING TIME ON SS AND BOD REMOVALS,
C. P. Straub, O. R. Placak, T. R. Ostrom, and O. W. Kochtitzky. 25 Aug 49, 11p

Descriptors: (*Sewage treatment, *Settling), Suspended sediments, Biological oxygen demand.

Laboratory studies were made on the settling characteristics of sewage samples collected throughout a 12-hour period. Samples of sewage, after various periods of quiescent settling, were examined for suspended solids (SS) content and biochemical oxygen demand (BOD) and the removals were noted.

PB-216 673
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PROCEDURES FOR MAKING AN INVENTORY OF AIR POLLUTION EMISSIONS,
August T. Rossano, Jr., and Norman E. Schell. 1957, 17p
Presented at the Golden Jubilee Meeting of the Air Pollution Control Association, St. Louis, Mo., 3 Jun 1957. Special Air Pollution Study of Louisville-Jefferson County, Kentucky.

Descriptors: (*Air pollution, Inventories), Sources.

In conducting an emission inventory, sources may conveniently be divided into two major classes, specific sources, largely industrial, which are studied on an individual basis and multiple sources, those too numerous to be treated individually. This latter class includes automobiles, trucks, residences, apartments, incinerators and many other sources which collectively contribute significantly to urban air pollution. The following discussion will be limited to a description of the air pollution emission inventory presently under development as part of the Special Air Pollution Study of Louisville-Jefferson County, Kentucky.

PB-216 674
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
PROCEEDINGS OF THE FIFTH SYMPOSIUM - PACIFIC NORTHWEST, ON SILTATION - ITS SOURCES AND EFFECTS ON THE AQUATIC ENVIRONMENT, MARCH 23-24, 1959.
1959, 37p

Descriptors: (*Water pollution, *Suspended sediments), Silts, Meetings, Fresh water biology, Turbidity.

Closely tied to water quality control is the significance of aquatic ecology - the aquatic environment. Planning must deal not only with the amount and distribution of water, but also with complex biotic interactions that take place under the surface of these waters. The symposium was concerned with the effects of siltation and turbidity, watershed management, and water uses.

PB-216 675
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
OCEANOGRAPHY AND RELATED ESTUARIAL POLLUTION POROBLEMS OF THE NORTHWEST.
Nov 59, 58p
Proceedings of the Symposium on Water Pollution Research, Pacific Northwest (6th) Held in Portland, Oreg., 17 Nov 59.

Descriptors: (*Estuaries, *Water pollution), Marine biology, Pacific Northwest, Mathematical models, Stratification, Ocean tides.

The report is the sixth of a series of symposiums on subjects related to water pollution research. The symposia was divided into three parts: Factors relating to flushing and exchange; Biological factors; and Measurements. The first part included classification of estuaries, potential significance of upwelling and significance of bottom topography. The second part discussed distribution of marine organisms in estuaries, waste disposal in the marine environment, and the relation of the estuary to marine production. The third part contained papers on models and their use and limitations and the validity of measurements.

PB-216 676
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
EFFECTS OF AND ON RECEIVING WATERS AND ENVIRONMENT (FLORA AND FAUNA) AND EFFECTS OF AND ON WATER TREATMENT PROCESSES AND PERSONNEL BY RADIOACTIVITY IN WATER SUPPLY,
Donrad P. Straub. 1957, 9p

Descriptors: (*Water pollution, *Radioactive contaminants), (*Water treatment, Radioactive contaminants).

The paper discusses the effect of radioactive waste materials upon the environment. (Author)

PB-216 677
Sanitary Engineering Center, Cincinnati, Ohio.
A NATIONAL WATER QUALITY BASIC DATA PROGRAM,
Ralph C. Palange, and Stephen Megregian. 1957, 12p
Presented at the Annual Convention, American Society of Civil Engineers, New York, N.Y., October 16, 1957.

Descriptors: (*Water pollution, Monitors).

The report very briefly summarizes a program to provide for continuous determination of the quality of the nation's waters. It is to establish base lines for measuring progress in water quality improvement and for detecting early deterioration of the water resources, and it can provide data useful in selection of sites for municipal and industrial water use, and for other legitimate purposes.

PB-216 678
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
LABORATORY CHEMICAL COAGULATION STUDIES ON THE REMOVAL OF FALLOUT RADIOACTIVITY IN WATERS,
Lloyd R. Setter, and Helen H. Russell. 19 Dec 57, 21p
Revision of report dated 29 Nov 57.

Descriptors: (*Water pollution, *Radioactive contaminants), (*Fallout, Water pollution), Coagulation, Rain.
Identifiers: *Precipitation washout.

It is the purpose of the paper to summarize the laboratory jar tests on chemical coagulation for removal of radioactive materials found in Cincinnati rain, cistern water, surface water, and rain leachings through native soils. Included in the study are results of coagulating carbonated and noncarbonated distilled water extracts of an alkaline soil contaminated with bomb debris. (Author Modified Abstract)

PB-216 679
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
SYMPOSIUM ON RESEARCH RELATED TO WATER POLLUTION IN THE NORTHWEST (2ND). HELD IN PORTLAND, OREGON ON JANUARY 20, 1958.

20 Jan 58, 11p

Descriptors: (*Research management, *Water pollution), Meetings.

The second symposium on research was held in Portland, Oregon on January 20, 1958. The theme of this symposium was 'financing of water pollution research projects.' The purpose was to acquaint those engaged in this field of research with the various sources of research funds and the requirements, methods of application and other pertinent information in each case.

PB-216 680
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ELECTRONIC ABSORPTION SPECTRA OF INORGANIC AND ORGANIC COMPOUNDS OF NITROGEN: I. NITROGEN DIOXIDE--DINITROGEN TETROXIDE IN SOLUTION,
Aubrey P. Altshuller, Donald Stephens, and Carol Meyers Schwab. 1957, 14p

Descriptors: (*Spectroscopic analysis, Nitrogen dioxide), (*Ultraviolet spectra, *Nitrogen dioxide), Absorption spectra.

The electronic absorption spectra for NO2-N2O4 mixtures has been measured in various non-polar and polar solvents. In non-polar solvents the spectra is very similar to NO2-N2O4 mixtures in the gas state. However, in solvents with unshared electron pairs available particularly ethers, esters, ketones and tertiary amines, a complex multibanded spectra is observed at room temperature. This spectra appears to be characteristic of NO2-N2O4 in those solvents and to be the result of the same electron donor-acceptor type molecular complexes reported previously in the literature at lower temperatures in the solid state. In olefins and n-alkyl amines reactions occur and the products formed are discussed. (Author)

PB-216 681
Public Health Service, Portland, Oreg. Region IX.
MINUTES OF THE PACIFIC NORTHWEST SYMPOSIUM (4TH) HELD IN PORTLAND, OREGON ON SEPTEMBER 4, 1968,
E. F. Eldridge. 4 Sep 58, 8p

Descriptors: (*Hazardous materials, *Bioassay), Toxicology, Meetings.

The development of industrial, agricultural and household chemicals has reached extensive proportions. Many of these chemicals are highly toxic and are chemically complicated. Since the effects of toxicity are largely biological, it is natural to turn to bioassay as a means of measuring these effects. A major objective of the symposium is to stimulate the use of bioassay and encourage its further development.

PB-216 682
Joint District, Federal and State Project for the Evaluation of Refinery Emissions.
HYDROCARBON LOSSES FROM VALVES AND FLANGES,
Robert K. Palmer. 1 Mar 57, 17p 2

Descriptors: (*Refineries, Air pollution), (*Petroleum refining, Air pollution), (*Air pollution, *Hydrocarbons), (*California, Air pollution), Industrial wastes, Valves.
Identifiers: *Los Angeles County (California).

Hydrocarbon leaks from valves and flanges in refineries may be responsible for appreciable emissions to the atmosphere. Questionnaires were sent out to obtain the number of valves and flanges, classified by service, in the refineries. A testing program was then initiated to obtain the leakage rates from a representative number of these units. Tests indicated that flanges were of minor importance as sources of emissions, having approximately one-tenth the leak frequency of valves. Nearly 10,000 valves were inspected, and the leakage was projected to the total population of 132,000 valves in Los Angeles County refineries. (Author)

PB-216 683
Joint District, Federal and State Project for the Evaluation of Refinery Emissions.
INTERIM PROGRESS REPORT,
Carl V. Kanter, Robert G. Lunche, Gerhardt C. Hass, Robert K. Palmer, and Victor H. Sussman. 1 Jul 56, 123p

Descriptors: (*Refineries, Air pollution), (*Petroleum refining, Air pollution), (*Air pollution, *Industrial wastes), (*California, Air pollution), Hydrocarbons, Combustion products, Sources.
Identifiers: *Los Angeles County (California).

Out of several sources of possible emissions in refineries, six were selected for evaluation in the opening phases of the joint project. Catalytic cracking unit plumes, Cooling towers, Pumps, Valves and flanges, Storage tanks, and Air blowing. Surveys were conducted to obtain information necessary for the planning of tests, extrapolation of test results, or as in the case of storage tanks, for the calculation of breathing, filling, and evaporation losses.

PB-216 684
Public Health Service, Washington, D.C.
EPIDEMIOLOGICAL STUDY OF AN OUTBREAK OF TYPHOID FEVER OCCURRING IN COVINGTON AND NEWPORT, KENTUCKY, AND ADJACENT TERRITORY,
F. C. Dugan, and J. K. Hoskins. 23 Apr 23, 29p

Descriptors: (*Typhoid, *Epidemiology), (*Kentucky, Typhoid), (*Water pollution, Typhoid), Public health, Bacterial diseases, Infectious diseases, Salmonella typhosa, Water supplies.
Identifiers: Ohio River.

The epidemic of typhoid fever in Vovington, Newport and adjacent territory was caused by the polluted water delivered to their consumers by the public water supply systems of those cities. The present treatment of the Covington supply, consisting of storage and chlorination as now provided, is inadequate, and cannot be relied upon to produce a safe effluent at all times. The crude method of application of chemicals for the purpose of coagulation of the Newport supply is not carefully regulated and is ineffective. Raw Ohio River water is absolutely unfit for human consumption without proper purification. These cities must expect recurrent epidemics of intestinal, water-borne diseases such as typhoid fever, dysentery and diarrhea, until all of the water supplied to their citizens is properly purified by a modern treatment plant. (Author Modified Abstract)

PB-216 685
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A REPORT ON PHENOLS IN EASTERN LAKE ERIE, SEPTEMBER 21-OCTOBER 14, 1955,
H. R. Pahren. 14 Oct 55, 26p

Descriptors: (*Lake Erie, *Phenols), (*Water pollution, Lake Erie).
Identifiers: *Water quality data.

The report presents the findings of a survey of the phenol content of waters in the eastern end of Lake Erie and compares the results to a similar survey conducted in 1948-49. (Author Modified Abstract)

PB-216 686
Consumer Protection and Environmental Health Service, Washington, D.C.
MODEL STATE HOUSING SOCIETIES LAW.
Community environmental management series,
Jan Krasnowiecki. 1970, 70p PHS-Pub-2025
Paper copy available from GOP $0.35 as HE20.117:H81.

Descriptors: (*Urban planning, Communities), (*Communities, Regulations), (*Organizations, Communities).

The report suggests means by which legal relationships and responsibilities of urban residents to each other may be worked out. The Model State Housing Societies Law is designed to authorize and encourage the formation of neighborhood housing organizations to enforce housing standards, to provide regular exterior and major interior maintenance, to own and maintain common areas and facilities, and to sponsor new or rehabilitated housing at low or moderate cost. The Housing Societies would be organized as nonprofit corporations and would exercise their powers by means of their bylaws, which would be in the form of covenants running with the land, imposed on member properties.

PB-216 687
Public Health Service, Dallas, Tex. Region VII.
PROCEEDINGS OF WATER RESOURCES WORKSHOP HELD AT DALLAS, TEXAS ON 24-26 MAY 1961.
May 61, 326p

Descriptors: (*Water resources, *Meetings), Water supply.

Contents: Water quality control as a major factor in water resources management; Population forecasting - methodologies and merits; Growth factors in economic base studies; Location factors; Projecting water requirements in the boondocks; Agriculture - effects on water demands; Estimating future water demand; Must water treatment be high priced; Must stream quality be maintained; Principles and policies for the evaluation and reimbursement of water supply and pollution abatement benefits from federal water storage projects; Should the public health service take a stand and make secondary treatment mandatory; A review of conclusions and agreements for future action.

PB-216 688
Federal Water Pollution Control Administration, Fresno, Calif. San Joaquin Project.
THE ANAEROBIC FILTER FOR THE DENITRIFICATION OF AGRICULTURAL SUBSURFACE DRAINAGE,
Thomas A. Tamblyn, and Bryan R. Sword. 1969, 34p
Presented at the Annual Purdue Industrial Waste Conference (24th), Lafayette, Indiana, 7 May 69.

Descriptors: (*Irrigation, Water pollution), (*Chemical removal (Water treatment), *Nitrogen), (*Water pollution, *Inorganic nitrates), (*Anaerobic processes, Chemical removal (Water treatment)), San Joaquin Valley.
Identifiers: *Denitrification.

The vast majority of the saline agricultural wastewater that is presently being generated within the San Joaquin Valley is discharged to the San Joaquin River. As the quantity of this waste increases, the waste load on the river would reach a point of extreme unacceptability. The San Joaquin River would become saline and downstream users would be deprived of a usable water supply. For these reasons, a system is now under construction to collect much of the saline drainage and transport it to a 'safe' disposal site. The material presented describes the operation of upflow anaerobic filters operated to determine if nitrate-nitrogen could be efficiently removed from the subsurface agricultural drainage. Filters of three sizes (4-, 18-, and 36-inch diameters) were operated under field conditions.

PB-216 689
Public Health Service, Washington, D.C. Bureau of State Services.
BIBLIOGRAPHY OF OCCUPATIONAL HEALTH. OCCUPATIONAL HEALTH AND RELATED PUBLICATIONS FROM THE PUBLIC HEALTH SERVICE. 1909-1953.
Bibliography series,
Frances L. Hyslop, and W. M. Gafafer. 1953, 117p
PHS-BS-9 PHS-Pub-300

Descriptors: (*Occupational diseases, *Bibliographies), (*Industrial medicine, Bibliographies).

The bibliography presents a comprehensive listing of Public Health Service publications on occupational health subjects issued through the year 1952, and the publications that appeared during part of the year 1953. The purpose of this bibliography is to provide a complete and continuing record for reference use. It calls to the attention of the readers, particularly those new to occupational health, voluminous information on early pioneering studies and other contributions by the Public Health Service to the detection and control of occupational diseases. (Author Modified Abstract)

PB-216 690
Federal Water Pollution Control Administration, Washington, D.C.
BIOLOGICAL FIELD INVESTIGATIVE DATA FOR WATER POLLUTION SURVEYS,
William Marcus Ingram, Kenneth M. Mackenthun, and Alfred F. Bartsch. Jul 66, 143p
WP-13

Descriptors: (*Water pollution, *Biological surveys), (*Aquatic biology, Water pollution), Terminology.

The book serves to introduce the non-biologist to the life sciences as they relate to water pollution and its control. The professional biologist, inexperienced in water pollution investigations, will find the book a quick introduction to field studies

of polluted streams, lakes and artificial impoundments. For the professional investigator, sources of further information, both general and detailed, are set forth in the selected references and bibliography to help in his field studies--an underlying feature of the national effort to conserve and protect our water resources. (Author Modified Abstract)

PB-216 691
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
HANDBOOK ON SANITATION OF AIRLINES, 1964 REVISION. STANDARDS OF SANITATION FOR THE CONSTRUCTION AND OPERATION OF COMMERCIAL PASSENGER AIRCRAFT AND SERVICING AND CATERING FACILITIES.
1964, 34p PHS-Pub-308

Descriptors: (*Aircraft, *Sanitary engineering), Public health, Water storage, Food dispensing.

Contents: Construction plans (Terminal facilities, Aircraft facilities); Aircraft potable-water system; Aircraft Galleys; Catering-point sanitation; Aircraft sanitation; Control of drinking water; Handling and disposal of wastes from aircraft.

PB-216 692
Public Health Service, Washington, D.C. Div. of Sanitation.
HANDBOOK ON SANITATION OF RAILROAD SERVICING AREAS. DESIGN AND OPERATION OF SANITATION FACILITIES FOR SERVICING RAILROAD PASSENGER CARS.
1951, 36p PHS-Pub-66

Descriptors: (*Railroad cars, *Sanitary engineering), Regulations, Handbooks, Standards.

The report is one of a set of three handbooks on railroad sanitation standards prepared by the Public Health Service. The standards of sanitary practice appearing in this publication, a handbook entitled 'Railroad Servicing Areas,' are intended for use as guides by (1) persons who design and operate railroad servicing equipment and facilities, and by (2) health department representatives and others who make periodic investigations or inspections of facilities and operations in servicing areas.

PB-216 693
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
HANDBOOK ON SANITATION OF VESSELS IN OPERATION. SANITATION FEATURES AND FACILITIES ON VESSELS IN OPERATION.
1963, 44p PHS-Pub-68

Descriptors: (*Water storage, *Public health), Regulations.

Contents:
Potable water;
Wash water;
Swimming pools;
Waste disposal;
Vermin control;
Food sanitation;
Ratproofing.

PB-216 694
Federal Water Pollution Control Administration, Cincinnati, Ohio.
AN ELECTRON MICROSCOPE STUDY OF COLLOIDS IN WASTE WATER,
R. B. Dean, Stig Claesson, Nils Gellerstedt, and Nils Boman. 26 Jan 67, 4p
Prepared in cooperation with Uppsala Univ. (Sweden). Inst. of Physical Chemistry. Pub. in Environmental Science and Technology, v1 n2 p147-150 Feb 67. Revision of report dated 1 Dec 66.

Descriptors: (*Sewage treatment, Colloids), (*Electron microscopy, *Sludge), Activated sludge process, Sludge, Bacteria.

Electron micrographs of the colloidal fraction in the effluent from an activated sludge waste water-treatment plant show fragments of bacterial cell walls as the dominant material. Viruses, phage, flagella, and other cellular debris are present to a lesser degree. Clarification by membrane filtration, or by flocculation with lime or ferric chloride, removes most of the colloidal material of cellular origin. (Author)

PB-216 695
Public Health Service, Washington, D.C.
WATER AND SEWER BOND SALES IN THE UNITED STATES.
1960, 12p

Descriptors: (*Sewers, *Financing), (*Water treatment, *Financing), Tables (Data).
Identifiers: *Bonds.

The tables supplement the annual publication of contract award data, last reported in Sewage and Water Works Construction 1960. The basic information from which these tables were developed was obtained from the Investment Bankers Association by special arrangement. It is believed these tables present information not otherwise readily available. Data are presented in three categories according to the use of the proceeds from the sale: (1) WATER when the bonds have been sold to finance water facilities; (2) SEWER, to finance sewage facilities; and (3) COMBINATION, to finance jointly water and sewage facilities where the portions attributable to each type are not designated.

PB-216 696
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
DETECTION OF AROMATIC ALDEHYDES.

1957, 5p

Descriptors: (*Aldehydes, *Spectroscopic analysis), Aromatic compounds, Colorimetric analysis.
Identifiers: Aceti anhydride/trifluoro.

The report discusses an investigation of a method to estimate polynuclear aromatic aldehydes. Essentially the procedure involves the reaction of the aldehyde with trifluoroacetic anhydride to form an arylidene di (trifluoroacetate). Then trifluoroacetic acid initiates condensation of the di (trifluoroacetate) with the hydrocarbon to form a diarylmethane type of dye. A fairly strong acid media is essential for complete ionization and solution of the dye. (Author Modified Abstract)

PB-216 697
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A PILOT STUDY OF AIR POLLUTION IN BIRMINGHAM, ALABAMA,
Seymour Hochheiser, Sanford W. Horstman, and Guy M. Tate, Jr. May 62, 56p SEC-TR-A62-22
Prepared in cooperation with City of Birmingham, Ala., and Jefferson County Dept. of Health, Birmingham, Ala.

Descriptors: (*Air pollution, *Alabama).
Identifiers: *Birmingham (Alabama), *Jefferson County (Alabama), *Air quality data.

In 1961 the City of Birmingham and Jefferson County, Alabama, in the interest of the control of air pollution, conducted a short-term, two-season air quality study. Air samples were collected for measurement of dustfall, suspended particulates, smoke shade, sulfur dioxide, nitrogen oxides, total oxidants, carbon monoxide, and hydrogen sulfide. (Author Modified Abstract)

PB-216 698
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
FUNDAMENTALS OF UNDERGROUND WASTE DISPOSAL,
Conrad P. Straub. Feb 56, 27p

Descriptors: (*Waste disposal, *Injection wells), (*Radioactive wastes, Injection wells).
Identifiers: *Liquid waste disposal.

The petroleum and chemical industries have employed ground disposal to their advantage for the disposal of their waste materials. The experience of these industries has been cited and extrapolated for possible use in the disposal of radioactive wastes. Unless a solution to this problem is found the accumulation of waste radioactivity from power reactors may very well place a limit on the benefits to be expected from nuclear power production. (Author)

PB-216 699
Public Health Service, Washington, D.C.
PRELIMINARY DESIGN EXPERIMENTAL WATER TREATMENT PLANT,
Conrad P. Straub. 1973, 14p

Descriptors: (*Water treatment, *Radioactive contaminants).

On October 29, 1948, a report (ORNL 48-10-377) prepared by O.R. Placak and R.J. Morton appeared entitled 'Proposal For Evaluating The Impact of Water-Borne Radioactive Contaminants On Sanitary Engineering Facilities'. This report called attention to the need for investigating the effect of radioactive substances upon the design and operation of sanitary facilities utilized by civilian or military populations, since limited background knowledge is available on this subject. They recommended that an experimental plant for the study of this problem should be provided. This report is concerned primarily with the design of the experimental water treatment plant facilities and of their approximate costs. (Author)

PB-216 700
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
TREATMENT OF LIQUID RADIOACTIVE WASTES - EUROPEAN PRACTICE.
Rept. for 9 Sep-11 Oct 57,
Conrad P. Straub. 19 Dec 57, 14p
Revision of report dated 1 Dec 57.

Descriptors: (*Radioactive waste processing, *Europe).

In the report , the experience of several Western European countries, United Kingdom, Denmark, Sweden, Norway, France, Netherlands, Belgium, in the handling, treatment, and disposal of liquid radioactive wastes is reviewed. (Author Modified Abstract)

PB-216 701
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ANALYTICAL CHEMISTRY IN AIR POLLUTION,
James P. Lodge, Jr. 1957, 10p

Descriptors: (*Air pollution, *Gas analysis).

The report points out that the purpose of an air pollution measurement must determine the techniques used in making that measurement. The knowledge necessary for an intelligent decision arises in part from previous analytical and other research. The nature and complexity of the sampling problem has been explored, and some work presently underway has been cited which may afford an eventual solution to this problem.

PB-216 702
Environmental Health Center, Cincinnati, Ohio.

ANALYTICAL PROCEDURES FOR INDUSTRIAL WASTES.
M. B. Ettinger. Oct 49, 13p

Descriptors: (*Industrial wastes, *Water analysis), Criteria.

The report discusses the analysis of industrial wastes giving consideration to the over-all problems involved. There is no elaboration of the details of any particular sampling, compositing or analytical procedure, or programming of the approach to any specific problem. Essentially, the discussion is concerned with the logic and reasoning behind the selection and application of analyses for evaluation of the sanitary importance of a particular waste. (Author)

PB-216 703
Environmental Health Center, Cincinnati, Ohio.
THE DETERMINATION OF PHENOLIC MATERIALS IN INDUSTRIAL WASTES.
M. B. Ettinger, and R. C. Kroner. 30 Nov 49, 31p
Presented at the Industrial Waste Conference (5th), Purdue Univ., 30 Nov 49.

Descriptors: (*Water pollution, Phenols), (*Water analysis, *Phenols), (*Industrial wastes, Phenols).
Identifiers: *Water pollution detection.

The report discusses various methods and procedures used in the determination of phenolic materials in industrial wastes. The analytical procedures used consisted of the application of a preliminary screening procedure followed by a measuring reaction.

PB-216 704
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SEWAGE AND WATER WORKS CONSTRUCTION, 1963.
Annual rept.

Jul 64, 17p PHS-Pub-758-1963
See also PB-216 756.

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), United States, Inventories.
Identifiers: *Sewage treatment plants.

The annual report of 'Sewage and Water Works Construction 1963' is published as one part of the basic data program required and authorized in Public Law 660, the Federal Water Pollution Control Act. The data published herein provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. This publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved. (Author Modified Abstract)

PB-216 705
Public Health Service, Washington, D. C. Div. of Water Supply and Pollution Control.
TRANSCRIPT OF CONFERENCE ON POLLUTION OF INTERSTATE WATERS OF THE NORTH PLATTE RIVER, WYOMING--NEBRASKA. TWO SESSIONS: SCOTTSBLUFF, NEBRASKA 12 SEPTEMBER 1961, AND CHEYENNE, WYOMING 21 MARCH 1962.

1962, 317p

Descriptors: (*Platte River, *Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution).

The report is a manuscript of the conference on the matter of pollution of the interstate waters of the North Platte River, involving the States of Nebraska and Wyoming and the Public Health Service, held under the provisions of the Federal Water Pollution Control Act. The purpose of the conference is to bring together the state water pollution control agencies, the Public Health Service, and other interested parties to review the existing situation, the progress which has been made, and to lay a basis for future action by all parties concerned and to give the states, localities, and industries an opportunity to take any remedial action which may be indicated under state and local law.

PB-216 706
Comptroller General of the United States, Washington, D.C.
EXAMINATION INTO THE EFFECTIVENESS OF THE CONSTRUCTION GRANT PROGRAM FOR ABATING, CONTROLLING, AND PREVENTING WATER POLLUTION.
3 Nov 69, 183p

Descriptors: (*Sewage treatment, *Project management), (*Investigations, *Government policies), Effectiveness, Contracts.
Identifiers: *Water pollution control.

Because of the substantial expenditure of Federal funds and expressed interest of several congressional committees in the water pollution control program, the General Accounting Office has examined into the effectiveness of the Federal Water Pollution Control Administration's (FWPCA) construction grant program for abating, controlling, and preventing water pollution. These projects have contributed to abating water pollution because the problem would have been worse if the projects had not been constructed. GAO believes, however, that the benefits have not been as great as they could have been because many waste treatment facilities have been constructed on waterways where major polluters--industrial or municipal--located nearby continued to discharge untreated or inadequately treated wastes into the waterways. The names of the rivers and municipalities have not been identified in the examples because the purpose of the examples is to demonstrate the existence of a problem. The program to date has been administered for the most part using a shotgun approach--awarding construction grants on a first-come-first-served or readiness-to-proceed basis. Little consideration has been given to the immediate benefits to be attained by the construction of individual treatment plants. (Author Modified Abstract)

PB-216 707
Public Health Service, Atlanta, Ga. Southeast Drainage Basins Office.
SOUTHEAST DRAINAGE BASINS: A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series summary rept.

1951, 259P PHS-Pub-153, PHS-WPS-13

Descriptors: (*United States, *Water resources), (*Southeast United States, *Water pollution), Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia.

The report presents information about the ways our water resources are used, the pollution going into our water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required. Part one considers the water pollution problems of the basin as a whole. Part two presents briefly the data for each of the several sub-basins of the major basin, including a list of projects now known to be needed for water pollution control.

PB-216 709
Public Health Service, Washington, D.C. Div. of Air Pollution.
THE SOURCES OF AIR POLLUTION AND THEIR CONTROL.
14 Dec 66, 21p

Descriptors: (*Air pollution, Sources).

The report reviews sources of air pollution due to motor vehicles, industry, power plants, space heating and refuse disposal and describes control of these pollutants.

PB-216 710
Federal Water Pollution Administration, Portland, Oreg. Northwest Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY. TILLER AND GALESVILLE PROJECTS, UMPQUA RIVER BASIN, OREGON.
Sep 66, 50p

Descriptors: (*Umpqua River Basin, *Reservoirs), (*Oregon, *Water resources).
Identifiers: *Douglas County (Oregon).

The purpose of this report is to define the need for and the value of storage for municipal and industrial water supply and for water quality control in the Tiller and Galesville projects, currently under study by the U.S. Army Corps of Engineers. The study area considered is the Umpqua River Basin, but particular attention has been given to the service areas and stream reaches of the South Umpqua, Cow Creek, and the main stem Umpqua that could be influenced by storage releases from the Tiller or Galesville sites. Projections of future waste loads, water quality, and water use have been developed for 1980, 2000, and 2020, based on the resource potential of Douglas County. (Author Modified Abstract)

PB-216 711
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
AN INDUSTRIAL WASTE GUIDE TO THE COMMERCIAL LAUNDERING INDUSTRY.

1948, 13p PHS-Pub-509

Descriptors: (*Laundries, *Water pollution).

Liquid wastes from commerical laundries which can contaminate water contain 'soil,' starch, dye traces, and lint removed from fabrics plus residuals of washing agents, alkali, and other chemicals. Appreciable waste reduction can be accomplished by avoiding over-use of washing agents and the control of washer loads in order to achieve the optimum ratio between washing agents and clothing load. A very large portion of commercial laundry wastes are discharged directly to municipal sewage systems and treated in admixture with domestic sewage. Considerable experimental work on the separate treatment of laundry wastes with trickling filters is reported in the literature. In actual practice, some laundry wastes are being treated by chemical flocculation and sedimentation. Further purification may be obtained by lagooning and sand filtration. (Author)

PB-216 712
Public Health Service, Washington, D. C.
THERMAL INACTIVATION OF COXIELLA BURNETII IN MILK PASTEURIZATION.
Monograph,
John B. Enright, Walter W. Sadler, and Robert C. Thomas. Jan 57, 37p PHS-M-47, PHS-Pub-517
Library of Congress catalog card no. 57-60053.

Descriptors: (*Food sanitation, Milk), (*Milk, Coxiella burnetii), (*Coxiella burnetii, *Thermal stability), (*Pasteurizing, Milk), Food sanitation, Food processing, Q fever, Infectious diseases, Public health.

In recent years, a significant number of human cases of Q fever have occurred in the United

States, some of which have been attributed to the consumption of milk. Upon investigation, it was ascertained that Q fever in cattle, goats, and sheep is endemic in certain western and southwestern States. It was observed that the danger of transmission of the disease to man could be reduced by slight changes in the procedures for pasteurizing milk. Because of the need for precise information as to the pasteurization times and temperatures necessary to assure destruction of the Q fever organism, the Public Health Service, in cooperation with the University of California, established a research project ot study the thermal destruction of this organism. Details about the research project and the new pasteurization recommendation which resulted from it are described in this monograph.

PB-216 713
Pollution Control Council, Portland,Oreg. Pacific Northwest Area.
MINIMUM REQUIREMENTS FOR PREVENTION OF INDUSTRIAL WASTES POLLUTION. RECOMMENDED SEWAGE WORKS DESIGN STANDARDS. WATER QUALITY OBJECTIVES,
E. F. Eldridge, Kenneth Spies, Emil C. Jensen, and H. C. Clare. Sep 52, 100p

Descriptors: (*Industrial waste treatment, Recommendations), (*Sewage treatment, Design).

The report briefly summaries the minimum requirements for the following industrial wastes: Slaughterhouses and meat packing plants, Poultry killing and packing plants, Milk plants, Canneries, Wineries, Breweries, Saw mills, Veneer mills, Oils, Tanneries, Beet sugar factories, Coal washeries, Gravel washeries, Flax processing, Dehydration-potatoes and fruits, metal industry, and pulp and paper mills. Also discussed are opinions as to current approved practice and suggestions regarding many of the details of design.

PB-216 714
Carnegie Inst. of Tech., Pittsburgh, Pa.
A PILOT PROBLEM-ORIENTED COMPUTER LANGUAGE FOR HYDROLOGY AND HYDRAULIC ENGINEERING ('HYDRO'),
G. Bugliarello, W. D. McNally, J. T. Gormley, and J. T. Onstott. 15 Aug 66, 41p
Contract PHS-WP-00415
Presented at the AGU Meeting (47th), Washington, D. C., April 1966.

Descriptors: (*Hydrology, Hydraulic models), (*Computer programming, Hydrology), Mathematical models, ALGOL, FORTRAN.
Identifiers: *HYDRO computer program.

The philosophy, specifications and operational characteristics of a problem-oriented computer language, HYDRO, for performing hydrological and hydraulic engineering analyses are presented. The present version of HYDRO is intended as a pilot for further development of the concept of problem-oriented languages in the field of water resources. It encompasses the areas of precipitation analysis, hydrograph analysis, open channel hydraulics, flood routing, and frequency analysis. (Author Modified Abstract)

PB-216 715
Joint District, Federal and State Project for the Evaluation of Refinery Emissions.
HYDROCARBON LEAKAGE FROM PRESSURE RELIEF VALVES,
Bernard J. Steigerwald. May 57, 27p 3

Descriptors: (*Refineries, Air pollution), (*Petroleum refining, Air pollution), (*Air pollution, *Hydrocarbons), (*California, Air pollution), Industrial wastes, Relief valves.
Identifiers: *Los Angeles County (California).

One phase of the Joint District, Federal and State Project for the Evaluation of Refinery Emissions was the study of hydrocarbon leakage from pressure relief valves. The report details the techniques and conclusions of the study. The seven major refineries in the Los Angeles area, processing about 90 per cent of the local crude throughput, reported a total of 1100 relief valves on operational units and 350 relief valves on pressure storage vessels. Field tests made on 460 valves indicated an average leak for valves on operational units of 2.9 pounds per day per valve while pressure storage valves leaked an average of 0.4 pounds per day per valve. The total hydrocarbon leakage, calculated by projecting the field test data to the reported number of valves in each group, was found to be 3500 pounds per day. This figure includes only continual leakage through the valve seat. Emissions due to relief valve blowoff were not considered in the study. (Author)

PB-216 716
National Center for Research and Training in the Hydrologic and Hydraulic Aspects of Water Pollution Control, Nashville, Tenn.
THERMAL POLLUTION: STATUS OF THE ART,
Frank L. Parker, and Peter A. Krenkel. Dec 69, 432p Rept. no. 3
Grant FWPCA-WP-01387-01
Prepared in cooperation with Vanderbilt Univ., Nashville, Tenn. Dept. of Environmental and Water Resources Engineering.

Descriptors: (*Water pollution, Heat), (*Reviews, Water pollution), Fresh water biology, Cooling towers, Salmon, Lagoon (Ponds).
Identifiers: *Thermal pollution, *Water pollution effects (Animals), *Water pollution effects (Plants), *Water pollution control.

Contents: Physical, biological and chemical effects on water quality; Effects of temperature on aquatic organisms; Effects of heated discharges on water quality and assimilation; Beneficial effects of heat additions; Prediction heat dissipation; Mechanisms of heated water discharges; Modeling of heated discharges; Cooling ponds and run of the river cooling; Cooling towers; Cooling tower problems; Comparison of cooling methods; and Literature review - effects of temperature on Pacific salmon.

PB-216 717
Public Health Service, Cincinnati, Ohio.
OHIO RIVER ODOR STUDIES.
Progress rept. Sep-Dec 50,
F. M. Middleton. May 51, 26p
Report on Ohio River Studies.

Descriptors: (*Ohio River, *Odors), (*Water pollution, Ohio River).

The purpose of the study, the methods of conducting it and the results for the month of August 1950 have been described in an earlier report. The present report includes data obtained on the standard odor substance, on raw water and on finished water for the period from September through December 1950. (Author)

PB-216 718
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER AND SEWER BOND SALES IN THE UNITED STATES.
Rept. for Jan-Dec 62.
Dec 62, 12p PHS-Pub-965-1962

Descriptors: (*Sewage treatment, *Financing), (*Water treatment, *Financing), United States, Tables (Data).
Identifiers: *Bonds.

The report contains data which are basic and necessary to efficient management of water supply and pollution control programs. It reflects, in a measure, the extent of financing to fulfill these two important public services in a growing nation. The basic information from which these tables were developed was obtained from the Investment Bankers Association by special arrangement. It is believed these tables present information not otherwise readily available. Data are presented in three categories according to the use of the proceeds from the sale: (1) WATER when the bonds have been sold to finance water facilities; (2) SEWER, to finance sewage facilities; and (3) COMBINATION, to finance jointly water and sewage facilities where the portions attributable to each type are not designated. It should also be noted that these data describe only those sales reported to the Investment Bankers Association. (Author Modified Abstract)

PB-216 719
National Center for Air Pollution Control, Washington, D.C.
AIR POLLUTION MANUAL OF CODING. A CODING SYSTEM FOR THE IDENTIFICATION OF BASIC EQUIPMENT AND CONTROL DEVICES USED IN INDUSTRIAL PROCESSING,
Peter Loquercio, and William J. Stanley. 1968, 67p

Descriptors: (*Air pollution, *Coding), (*Information retrieval, Air pollution), Sources, Industries.
Identifiers: *Emission factors.

The Manual is prepared in two parts. Part I lists some of the industrial activities by their Standard Industrial Classification number and the equipment associated with the air pollution sources found in that activity. Part II illustrates the code numbers assigned to the equipment; two digit numbers representing control devices while the three digit numbers are assigned to the basic equipment. By definition, basic equipment is equipment from which the pollutant is primarily discharged. The basic equipment is further categoried by assigning a series of numbers according to the 'unit process' under which it may be found.

PB-216 720
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE DEVELOPMENT OF METHODS FOR USING BIOASSAYS IN THE CONTROL OF PULP MILL WASTE DISPOSAL,
Charles E.Warren, and Peter Doudoroff. 1957, 25p
Prepared in cooperation with Oregon State Coll., Corvallis. Dept. of Fish and Game Management.

Descriptors: (*Paper industry, *Water pollution), (*Bioassay, Water pollution), Industrial wastes, Toxicology, Benthos.

The paper is a discussion of research at Oregon State College in methods of determining permissible concentrations of pulp mill wastes in receiving waters by means of bioassays and application factors. Standard and convenient toxicity bioassay methods are being developed, and application factors for making use of the results of these bioassays are being determined experimentally in part by means of 'artificial streams' approximating natural conditions. Pulp mill wastes, whose acute toxicity has already been evaluated by means of bioassays, are introduced continuously in varying amounts into these streams for periods as long as one month. A similar approach is being developed for the control of the discharge of pulp mill wastes so that resulting 'slime' production can be maintained at biologically harmless levels.

PB-216 721
National Center for Urban and Industrial Health, Cincinnati, Ohio.

PROCEEDINGS: NORTHWEST SHELLFISH SANITATION RESEARCH PLANNING CONFERENCE, 1966.
Environmental health series: Urban and Industrial health,
W. J. Beck, and J. C. Hoff. 1967, 94p

Descriptors: (*Water pollution, Shellfish), (*Shellfish, *Food sanitation), Proceedings, Fishing grounds, Estuaries, Microbiology, Ecology, Food storage, Polioviruses, Coliform bacteria, Dinoflagellata, Toxins + antitoxins.
Identifiers: Gonyaulax.

Contents:
- Comparative study of several indicator organisms in samples collected from three northwest watersheds;
- Studies on the incidence of Clostridium botulinum Type E in some west coast estuarine areas;
- Studies on wet storage of oyster and clam shellstock;
- Accumulation of bacteria by two species of west coast shellfish maintained in an estuarine environment;
- Chemical and biological analysis of shellfish and seawater;
- Ecological studies;
- Accumulation and storage of west coast shellfish polluted with Clostridium botulinum type Type E spores;
- Depuration of west coast hard-shell clams;
- Accumulation and elimination of poliovirus by the olympia oyster (Ostrea lurida);
- Research on gonyaulax toxins.

PB-216 722
Public Health Service, Washington, D.C.
REPORT OF A WATER QUALITY SURVEY OF HAMPTON ROADS SHELLFISH AREAS.
Rept. for 11 Oct 59-21 Feb 50.

Aug 50, 125p

Descriptors: (*Water pollution, Shellfish), (*Shellfish, Fishing grounds), (*Fishing grounds, Water quality), (*Hampton Roads, Water pollution), Virginia, Environmental surveys, Bacteriology, Biological surveys, Sewage, Coliform bacteria.
Identifiers: *Water quality data.

A survey of the bacterial quality of the waters overlying the shellfish growing areas in and near Hampton Roads was made during the period from October, 1949 to February, 1950. Conclusions drawn from the results obtained during the survey are reported.

PB-216 723
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT ON LABORATORY INVESTIGATION OF A POLYELECTROLYTE, NALCO 600,
Jesse M. Cohen. 29 Nov 56, 26p
Revision of report dated 17 Oct 56.

Descriptors: (*Polyelectrolytes, *Sewage treatment), (*Coagulants, Polyelectrolytes), Toxicology.

The report describes results of laboratory tests performed on commercial polyelectrolytes designed for use in sanitary chemistry application.

PB-216 724
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION CONTROL RESEARCH AT THE ROBERT A. TAFT SANITARY ENGINEERING CENTER,
Leslie A. Chambers, V. G. MacKenzie, and Milton J. Foter. 1954, 12p

Descriptors: (*Air pollution, Research).

The report describes research efforts in the field of air pollution relative to causes, detrimental effects on human and environment, methods of sampling and proposed methods of control.

PB-216 725
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PRELIMINARY REPORT: STUDY OF THE EFFECTS OF AIR POLLUTION AND WEATHER ON CARDIOVASCULAR MORTALITY IN CINCINNATI, 1952,
Eugene K. Harris. Apr 55, 21p

Descriptors: (*Cardiovascular diseases, *Air pollution), Mortality, Weather, Climatology, Correlations, Public health.
Identifiers: *Air pollution effects (Humans).

The direction of a deviation in weekly deaths from cardiovascular disease may be predicted fairly well from certain environmental variables, but the magnitude of the change is of too complex an origin to be accounted for solely in terms of these variables.

PB-216 728
Public Health Service, Cincinnati, Ohio. Office of Stream Sanitation.
NORTH CANADIAN RIVER INVESTIGATION. A STUDY OF THE POSSIBLE CHANGES IN THE QUALITY OF THE WATER OF THE NORTH CANADIAN RIVER FOR WATER SUPPLY AND OTHER PURPOSES DUE TO PROPOSED FLOOD CONTROL RESERVOIRS, AND THE QUANTITY OF DILUTING WATER REQUIRED FOR POLLUTION ABATEMENT BELOW OKLAHOMA CITY,
Mark D. Hollis. 1939, 71p

Descriptors: (*North Canadian River Basin, *Reservoirs), (*Oklahoma, *Water resources).

The scope of the survey was confined to a study of the need, the value, and the effect of conservation storage, should a proposed channel reservoir in the North Canadian River basin be so constructed as to operate in the interest of pollution abatement as well as for other purposes for which designed. (Author)

PB-216 729
Carnegie Inst. of Tech., Pittsburgh, Pa. Dept. of Civil Engineering.
HYDRO REFERENCE MANUAL - A CONTENT-ORIENTED COMPUTER LANGUAGE FOR HYDRAULIC ENGINEERING,
William D. McNally. Sep 66, 294p
Contract PHS-WP-00415

Descriptors: (*Hydrology, Hydraulic models), (*Computer programs, Hydrology), Mathematical models, ALGOL.
Identifiers: HYDRO computer program.

The HYDRO computer system, for the solution of hydrology and hydraulic engineering problems, consists of an input language for the user and a processor for accepting and translating inputs into an equivalent program for execution. The input language is presented in the HYDRO Users Manual. The present manual describes the HYDRO processor in detail as well as the means for augmenting it and implementing it at different computer centers. (Author)

PB-216 730
Massachusetts Univ., Amherst. Environmental Engineering.
DEWATERING OF SEWAGE SLUDGE ON GRANULAR MATERIALS.
Rept. no. 2 (Final),
John H. Mebiker, and Thomas G. Sanders. Jun 68, 144p EVE-9-68-3, RR-1
Grant NSF-GK-924, FWPCA-01239-02

Descriptors: (*Sludge disposal, *Dewatering), (*Sewage treatment, Dewatering).
Identifiers: Sludge treatment.

A theoretical analysis of gravity dewatering of wastewater sludge is made, and an equation describing the drainage rate developed. The equation relates the depth of sludge with time, using the parameters of solids content, specific resistance, coefficient of compressibility, and dynamic viscosity and density of the filtrate. Extensive bench-scale tests substantiated the theory. The concept of media factor is introduced to account for the role of the supporting media. Potential applications of the equation developed are discussed. (Author)

PB-216 731
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WATER DECONTAMINATION,
Conrad P. Straub. 1955, 40p

Descriptors: (*Water pollution, *Radioactive contaminants).

Although radioactivity has been known since 1896 when Bequerel first observed the phenomenon by its effect on photographic plate, it has been of little concern or interest to the sanitary engineering profession until recent times -- during the last decade in particular. Our interest and concern stems from the fact that large quantities of radioactive materials are produced during fission of certain naturally occurring heavy radioactive materials in nuclear reactors or piles. The report presents a discussion and recommendations for the decontamination of water from radioactive contaminants. (Author Modified Abstract)

PB-216 732
Public Health Service, Washington, D.C.
AN INDUSTRIAL WASTE GUIDE TO THE CANE SUGAR INDUSTRY.
1959, 25p PHS-Pub-691

Descriptors: (*Cane sugar, Food processing), (*Food processing, *Industrial waste treatment).
Identifiers: *Water pollution control.

Published information on the water usage of cane sugar factories and on their waste loads is rather limited and concerned mainly with conditions in Louisiana where pollution from this source has long been a problem. The Stream Control Commission of Louisiana at Baton Rouge has an excellent collection of data on the variations in waste loads. The publications listed in the bibliography also provide useful information. The papers summarizes available information on the nature, types, and amounts of wastes produced by the industry, and the methods which have been developed and used to overcome or minimize the harmful effects of waste effluents. (Author Modified Abstract)

PB-216 733
Federal Water Pollution Control Administration, Washington, D.C.
ADVANCED WASTE TREATMENT PROJECT AT LEBANON, OHIO. NEW WATER FOR OLD.

1966, 11p WP-19

Descriptors: (*Sewage treatment, Research).

The Lebanon waste treatment plant provides conventional primary sedimentation and activated sludge secondary treatment. The processes being evaluated and developed at Lebanon to remove the suspended solids, organic materials, and dissolved salts are microscreening, filtration, chemical coagulation, powdered carbon adsorption, and electrodialysis. Detailed information on these processes is given.

PB-216 734
Public Health Service, Washington, D.C.
PROCEEDINGS OF THE ANNUAL CONFERENCE OF THE SURGEON GENERAL PUBLIC HEALTH SERVICE AND CHIEF, CHILDREN'S BUREAU WITH STATE AND TERRITORIAL HEALTH OFFICERS, STATE MENTAL HEALTH AUTHORITIES AND REPRESENTATIVES OF STATE HOSPITAL SURVEY AND CONSTRUCTION AGENCIES (52ND). HELD AT WASHINGTON, D. C. ON 5-7 NOVEMBER 1953.
1954, 51p PHS-Pub-338

Descriptors: (*Public health, Government policies), Meetings.

Committee recommendations are presented in the areas of environmental sanitation, federal relations, hospitals, infectious deseases, maternal and child health, mental health, and special health and medical services.

PB-216 735
Bureau of Solid Waste Management, Cincinnati, Ohio.
PARTIAL OXIDATION OF SOLID ORGANIC WASTES.
Final rept.,
William W.Shuster. 1970, 110p BSWM-SW-7rg PHSPub-2133
Grant PHS-EC-00263
Library of Congress Catalog Card No. 74-609260.

Descriptors: (*Waste disposal, *Materials recovery), Oxidation.
Identifiers: *Solid waste disposal.

A study was made of the possibility of utilizing the organic content of solid municipal waste by reforming high molecular weight organic compounds into simpler compounds of economic interest. Major components of waste such as paper and leaves were investigated. In addition, a dried sewage sludge used as a soil conditioner and containing a large amount of organic matter was also studied. (Author Modified Abstract)

PB-216 736
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
SOME DEVELOPMENTS IN THE WATER POLLUTION RESEARCH PROGRAM OF THE PUBLIC HEALTH SERVICE,
J. K. Hoskins. 1939, 12p

Descriptors: (*Water pollution, Research).

The report describes the activities of a research center engaged in matters pertaining to water, sewage, and stream pollution.

PB-216 737
Public Health Service, Washington, D.C.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE RED RIVER OF THE NORTH BASIN, DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES OF MINNESOTA, NORTH DAKOTA, AND SOUTH DAKOTA.
Water pollution series.
1953, 14P PHS-Pub-293 PHS-WPS-53

Descriptors: (*Red River of the North, *Water pollution), (*North Dakota, Water pollution), (*Minnesota, Water pollution), (*South Dakota, Water pollution).

The comprehensive program for the Red River of the North is based on the program of the water pollution control agencies of the States of North Dakota, South Dakota, and Minnesota for this stream. A number of reports of State and Federal cooperative investigations of this interstate stream have been published and have considered present and anticipated future water uses, the quality of water necessary to permit these uses, sources of pollution and their effects on the receiving waters and water uses, benefits derived from abatement of pollution, the added detrimental effect of critical low flows, and finally-needed pollution abatement facilities. The report is a compilation of these findings. (Author Modified Abstract)

PB-216 738
Washington State Univ., Pullman.
THE BIOLOGY AND CHEMISTRY OF 'SPHAEROTILUS'.
Progress rept. 1 Jun 61-1 Sep 63,
J. L. Stokes. 10 Sep 63, 34p
Contract PHS-WP-00239

Descriptors: (*Sphaerotilus, *Biochemistry), (*Microbiology, Sphaerotilus), Nutrition, Aerobic bacteria, Metabolism, Growth, Carbon, Nitrogen, Manganese, Iron, Butyric acid.
Identifiers: *Iron bacteria, *Sphaerotilus discophorus.

Eleven pure cultures of Sphaerotilus discophorus were isolated from streams, rivers and lakes by appropriate enrichment culture techniques. The morphology of the colonies, filaments and individual cells was investigated in detail. The carbon, nitrogen, mineral and growth factor requirements of S. discophorus were determined. The effects of pH, temperature and oxygen on growth were established. The extent to which iron and manganese are accumulated in the sheaths of S. discophorus was determined by quantitative analyses. The oxidative patterns of S. discophorus with carbohydrates, amino acids and TCA cycle intermediates were determined and the occurrence of a high degree of oxidative assimilation was established. Large amounts of poly-beta-hydroxybutyric acid were found in the cells of both S. discophorus and S. natans. Preliminary investigations were also made on the problem of chemoautotrophy in Sphaerotilus. (Author)

PB-216 739
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
STREAM RADIOACTIVITY SURVEYS - BIOLOGICAL ASPECTS,
Croswell Henderson. 1956, 20p

Descriptors: (*Water pollution, Radioactive contaminants), (*Columbia River, *Radioactive contaminants), Biological surveys, Accumulation, Residues.

The report discusses the different kinds of samples to be collected and used for radioactivity determinations in a stream radioactivity survey. Among these are water, mud, plankton, filamentous algae, bottom animals, and fish. Studies have shown that certain radioisotopes may be concentrated to a high degree in some aquatic organisms. Information is desired as to the effect of radioactivity on aquatic animals such as fish or shellfish or on the use of these animals for human food. (Author Modified Abstract)

PB-216 740
Federal Water Pollution Control Administration, Washington, D.C.
WATER QUALITY CRITERIA. REPORT OF THE NATIONAL TECHNICAL ADVISORY COMMITTEE TO THE SECRETARY OF THE INTERIOR.
1 Apr 68, 244p
Paper copy available from GPO $3.00 as stock no 167..2:W29/3.

Descriptors: (*Water pollution, Standards), (*Water quality, Criteria), Recreation, Water supply, Fresh water biology, Toxicology, Agriculture, Industrial wastes, Food processing.
Identifiers: *Water pollution standards.

The report is a comprehensive compilation of water quality criteria to be used for the setting of standards in compliance with the Federal Water Pollution Control Act as amended by the Water Quality Act of 1965. The criteria considered include those concerned with recreation and aesthetics, public water supplies, fish, other aquatic life, wildlife, agricultural uses, and industry.

PB-216 741
North Carolina Univ., Chapel Hill. Dept. of Environmental Sciences and Engineering.
MICROBIOLOGY OF ANAEROBIC SLUDGE.
Terminal rept. 1 Jun 66-31 May 69,
Robert A. Mah. 31 May 69, 40p
Contract WP-00092I-03

Descriptors: (*Anaerobic processes, *Microbiology), (*Sewage treatment, Anaerobic processes), Fermentation.
Identifiers: Methane bacteria.

Studies on the microbiology of anaerobic sludge disclosed that nonmethanogenic strictly anaerobic bacteria comprised one of the most numerous groups of organisms present. Euryoxic bacteria constitute only a minor fraction of the normal bacterial flora but can become predominant in very short time if fermentable carbohydrates are present. This finding emphasizes the necessity of using unenriched fermentations for studying the sludge digestion process. Lipids are the main substrates responsible for generation of acetate in the unaltered normal sludge fermentation. Organisms responsible for lipid decomposition are apparently slow-growing and are washed out of the digestor at short retention times. Recycling of the bacteria would enable the operator to shorten retention time without a loss in efficiency of decomposition. (Author)

PB-216 742
National Center for Urban and Industrial Health, Cincinnati, Ohio.
PROCEDURE FOR THE BACTERIOLOGICAL EXAMINATION OF FOOD UTENSILS AND/OR FOOD EQUIPMENT SURFACES.
Technical information bulletin no. 1.

1960, 8P PHS-Pub-1631

Descriptors: (*Food processing, *Bacteriology), (*Food, Equipment), Standards, Food sanitation, Public health.

The Public Health Service recommends a standard of not more than 100 colonies per utensil, or surface area of equipment swabbed. Though this standard does not take into consideration the types of microorganisms present or their public health significance, it does offer a general index of utensil and equipment sanitation. When counts from a particular establishment are frequently or consistently in excess of the standard, improvement of its washing, sanitizing, handling, and/or storage practices is usually indicated. For equipment on which five areas of approximately 8 sq. in. each have been swabbed, residual bacterial counts not exceeding 500 are satisfactory.

PB-216 743
Environmental Health Center, Cincinnati, Ohio.
INDUSTRIAL WASTE SURVEY REPORT, APRIL 28 TO MAY 5, 1953.
1953, 19p
Prepared in cooperation with Archer-Daniels-Midland Co., Wyandotte, Mich. Chemical Products Div.

Descriptors: (*Detroit River, *Water pollution), (*Michigan, Water pollution).
Identifiers: *Wyandotte (Michigan).

The survey was conducted to determine the characteristics of the process wastes and the

residual pollution load discharged from the plant to the Detroit River and to study the efficiency of the large trap handling the bulk of the plant's water-carried wastes. (Author Modified Abstract)

PB-216 744
Public Health Service, Washington, D.C. Div. of Engineering Services.
A DIGEST OF STATE AIR POLLUTION LAWS.

1959, 122p PHS-Pub-711-Ed-59

Descriptors: (*Air pollution, *Law (Jurisprudence)), United States, Inventories, Legislation, State government.

The Digest of State laws relating to air pollution was prepared with the assistance of the Public Health Division, Office of the General Counsel, Department of Health, Education, and Welfare, from an examination of pertinent State statutes.

PB-216 745
Public Health Service, Washington, D.C.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE YAKIMA RIVER BASIN, DEVELOPED BY WASHINGTON POLLUTION CONTROL COMMISSION.
1953, 24p PHS-Pub-292

Descriptors: (*Yakima River Basin, *Water pollution), (*Washington (State), Water pollution).

The document describes the comprehensive water pollution control program developed by the Washington Pollution Control Commission for the Yakima River Basin. The initial industrial pollution abatement requirements for the program are the 'Minimum Requirements for Prevention of Industrial Waste Pollution,' adopted by the Pollution Control Council of the Pacific Northwest area and recently incorporated in the Washington Pollution Control Commission regulations for water pollution abatement. The Comprehensive Program for the Yakima River Basin was developed upon completion of studies and investigations of the sources and magnitudes of polluting wastes discharged into the main river, tributaries, and canals, and of the effects of these wastes upon the quality of the receiving waters. (Author Modified Abstract)

PB-216 746
Massachusetts Univ., Amherst. Environmental Engineering.
LOW PRESSURE ULTRAFILTRATION SYSTEM FOR WASTEWATER CONTAMINANT REMOVAL.
Progress rept. 1 Jun 68-1 Mar 69,
Rolf T. Skrinde, Tsuan Hua Feng, Philip A. Lutin, and W. Leigh Short. 1 Mar 69, 156p EVE-15-69-3
Grant FWPCA-WP-01408-01

Descriptors: (*Water treatment, *Osmosis), (*Water reclamation, Osmosis), (*Sewage treatment, Water reclamation), Membranes, Design criteria.
Identifiers: *Reverse osmosis.

The purpose of the research was to obtain data needed to evaluate and apply reverse osmosis as a process for the treatment of wastewaters. Objectives were to obtain data essential to development of design parameters, and to apply them in developing membrane separation techniques for advanced treatment of organic industrial wastes and municipal sewage.

PB-216 747
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
LIMITATIONS OF EUGLENIDAE AS POLLUTED WATER INDICATORS,
James B. Lackey, and Russell S. Smith. 1939, 12p

Descriptors: (*Scioto River, Euglenophyta), (*Euglenophyta, *Indicator species), (*Water pollution, Indicator species), Ecology, Aquatic biology, Sewage, Biological surveys.
Identifiers: *Water pollution detection.

Criteria of stream pollution may be all too evident in turbid, highly colored, offensive smelling streams. But often relatively clear sparkling streams need laboratory examination to determine the nature and extent of their pollution. Biological examinations may include several features as the microscopic life present, or the animals living in or on the bottom. For sometime it has been stated that the presence of certain microscopic organisms in abundance is a sure indication of organic pollution, usually domestic sewage. One of the groups used in this fashion has been the 'Euglenas and their allies', a related group of green flagellates. The report discusses their presence on the Scioto River in Ohio.

PB-216 748
Rutgers - The State Univ., New Brunswick, N.J. Dept. of Environmental Science.
CONTINUOUS FLOW AND BATCH CULTURES OF SPHAEROTILUS.
Terminal progress rept.,
M. S. Finstein, and F. F. Dias. Jun 68, 74p
Grant PHS-WP-212

Descriptors: (*Sphaerotilus, *Biochemistry), Nitrogen inorganic compounds, Calcium, Sulfites, Metabolism, Growth, Nutrition.
Identifiers: *Iron bacteria, *Sphaerotilus natans.

Interest in the filamentous, sheathed bacteria of The genus Sphaerotilus stems, in part, from their ability to grow in large masses in water courses which impair the recreational and other uses of water courses. Sphaerotilus species are also associated with failures in the treatment of waste waters by the activated sludge method in which the filaments of Sphaerotilus have been thought to interfere with the settling of the flocs. The report describes investigations on the growth of Sphaerotilus natans in continuous flow cultures.

PB-216 749
Texas Univ., Austin. Environmental Health Engineering Research Lab.
EFFECTS OF TOXIC ORGANICS ON PHOTOSYNTHETIC REOXYGENATION.
Technical rept.,
Ju-Chang Huang, and Earnest F. Gloyna. 1 Aug 67, 178p
Grant FWPCA-WP-00688-03

Descriptors: (*Water pollution, Fresh water biology), (*Photosynthesis, Water pollution), (*Phenols, Water pollution), (*Pesticides, Water pollution), Chlorophyll, Toxicology.
Identifiers: *Water pollution effects (Plants), Chlorella pyrenoidosa.

The report describes the potential reduction of dissolved oxygen in ponds and streams due to chlorophyll inhibition resulting from certain industrial wastes. Emphasis is placed on the laboratory techniques developed for this study and the changes that should be incorporated in waste stabilization pond designs. The relative toxicity of 33 phenolic-type compounds and 8 pesticides to Chlorella pyrenoidosa was evaluated. (Author Modified Abstract)

PB-216 750
Public Health Service, Kansas City, Mo. Region VI.
PROCEEDINGS OF SYMPOSIUM ON WASTE STABILIZATION LAGOONS HELD IN KANSAS CITY, MO., 1-5 AUG 60,
Glen J. Hopkins. 1960, 236p
Sponsored in part by Missouri Basin Engineering Health Council, Kansas City.

Descriptors: (*Sewage treatment, Lagoons (Ponds)), (*Industrial waste treatment, Lagoons (Ponds)), (*Lagoons (Ponds), *Meetings).
Identifiers: *Aeration ponds.

The report presents discussions of research on and experience in the design, construction, operation and maintenance of waste stabilization lagoons.

PB-216 751
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
KENTUCKY RIVER BASIN REPORT ON THE BENEFITS TO POLLUTION ABATEMENT AND WATER SUPPLY RESULTING FROM LOW--FLOW AUGMENTATION.

Jul 57, 34p

Descriptors: (*Kentucky River Basin, *Water pollution), (*Kentucky, Water pollution), Water supply.
Identifiers: Low flow.

In accordance with a request dated July 26, 1956, from the office of the District Engineer, Louisville District, Corps of Engineers, U.S. Army, the Public Health Service has conducted a study of the water supply and waste disposal problems of the Kentucky River Basin. This report evaluates the pollution abatement and public-water-supply benefits resulting from projected low-flow augmentation in the Kentucky River and its major tributaries. (Author Modified Abstract)

PB-216 752
Michigan Univ., Ann Arbor. School of Public Health.
PROGRAMMED INSTRUCTION IN WATER POLLUTION CONTROL. UNIT IV. WASTE-WATER TREATMENT,
K. H. Mancy, F. G. Pohland, and W. J. Parker. 22 Mar 68, 124p
Grant FWPCA-WP-139-01

Descriptors: (*Water pollution, *Education), (*Manuals, Water pollution).

The report is a programmed instruction book designed to teach some of the basic principles of wastewater treatment.

PB-216 753
New Mexico Dept. of Public Health, Santa Fe.
REPORT ON AN INVESTIGATION OF POLLUTION OF GROUND WATER IN THE GRANTS - BLUEWATER, NEW MEXICO, AREA,
Robert P. Lowe, Joe Anderson, F. W. Kittrell, A. Fitch, and E. C. Peterson. 1956, 25p
Prepared in cooperation with Public Health Service, Dallas, Tex. Region VII, Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, and The Anaconda Company, Bluewater, New Mexico.

Descriptors: (*Industrial wastes, *Water pollution), (*New Mexico, Water pollution), Uranium ores.
Identifiers: *Uranium ore processing, *Valencia County (New Mexico).

The New Mexico Department of Public Health requested the assistance of the Public Health Service in an investigation of waste disposal at the uranium ore milling plant of the Anaconda Company at Bluewater, New Mexico. The investigation was undertaken because of concern over possible pollution of groundwater in the Grants-Bluewater area. The Health Department expressed particular concern over the possibility of excessive nitrates from the mill wastes polluting the wells that serve as the source of municipal water supply for Grants, New Mexico. The report summarizes activities and data available to date, and suggests the direction in which the investigation should continue.

PB-216 754
Stone (Ralph) and Co., Inc., Los Angeles. Calif.
SOLID WASTES LANDFILL STABILIZATION.
Interim rept.

1968, 144P
Grant PHS-UI-00018

Descriptors: (*Waste disposal, Earth fills), (*Earth fills, *Aeration), Compacting.
Identifiers: *Solid waste disposal, *Sanitary landfills.

The objectives were to demonstrate the use of aeration in sanitary landfills to provide more rapid stabilization, increased capacity, and land reclamation for construction and other uses; and to compare the densities achieved in sanitary landfills using various types of compaction equipment.

PB-216 755
General Electric Co., Cincinnati, Ohio. Aircraft Gas Turbine Div.
CONFIDENCE LIMITS FOR AN UNKNOWN CONCENTRATION ESTIMATED FROM LINEAR CALIBRATION.
Technical information series,
Eugene K. Harris. Jul 58, 8p R58AGT494

Descriptors: (*Chemical analysis, Confidence limits).

Initial study of an analytical method for determining the amount of some substance frequently leads to a calibration curve on which the response of a test indicator are plotted against carefully measured amounts of the substance. In practice, however, such a curve is used to estimate an unknown amount of substance from an observed value of the indicator variable - exactly converse to the way in which it is prepared. Berkson has shown that this estimation is valid when the relationship between substance (x) and indicator (y) is linear, provided that in obtaining the calibratiin line an attempt is made to measure x to certain predetermined amounts. The estimation of x from y is not invalidated by the fact that the original measurement of x may have been subject to error. The purpose of the note is to call attention to confidence limits available for such an estimate. (Author)

PB-216 756
Public Health Service, Washington, D.C.
SEWAGE AND WATER WORKS CONSTRUCTION, 1962.
Annual rept.
Apr 63, 16p PHS-Pub-758-1962
See also PB-216 704.

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), Inventories, United States.
Identifiers: *Sewage treatment plants.

The annual report of 'Sewage and Water Works Construction 1962' is published as one part of the basic data program required and authorized in Public Law 660 the Federal Water Pollution Control Act. The data published provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. This publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved. (Author Modified Abstract)

PB-216 757
Public Health Service, Denver, Colo. Region VIII.
WATER RESOURCES STUDY AND PUBLIC HEALTH ASPECTS OF THE JEFFERSON AND WHITEHALL UNITS THREE FORKS DIVISION MISSOURI RIVER BASIN PROJECT MONTANA.

Apr 64, 68p

Descriptors: (*Missouri River Basin, *Reservoirs), (*Montana, Water resources), Jefferson Reservoir, Whitehall Reservoir, Insects.

The objectives of the study were to assess the probable effects of project construction and operation on water quality in local streams and reservoirs, to ascertain the benefits or harm resulting from changes in water quality, and to examine the need for regulation of streamflow for the purpose of water quality control in the principal streams affected. Need for regulation of streamflow was studied not only in light of present conditions, but also under anticipated economic development of the years 1985, 2010, and 2060. The report also includes the results of a study of general public health aspects and insect vector control of the project. A preliminary evaluation is presented of the insect vector problems that may be associated with the development of the Jefferson and Whitehall Irrigation Units. (Author)

PB-216 758
Genesee County Metropolitan Planning Commission, Flint, Mich.
SOLID WASTE DISPOSAL STUDY, GENESEE COUNTY, MICHIGAN.
Technical rept.,
Denzil L. Robinson, T. Ray Johnson, Walter C. Kingsley, Jr., Theodore P. Mansour, and LeRoy Nichols. Jun 68, 247p

Descriptors: (*Michigan, *Waste disposal).
Identifiers: *Genesee County (Michigan).

The objective was to conduct a thorough solid waste disposal study for the Flint and Genesee County Metropolitan Area, and recommend an area-wide disposal system.

PB-216 759
Environmental Health Center, Cincinnati, Ohio.
SENSITIZING THE 4-AMINOANTIPYRINE REACTION WITH PHENOLIC MATERIALS FOR USE IN WATER AND WASTE ANALYSIS,
M. B. Ettinger, C. C. Ruchhoft, and R. J. Lishka.
6 Sep 50, 38p
Presented at the National Meeting of the American Chemical Society (118th) at Chicago, Illinois, on 3-8 September 1950.

Descriptors: (*Water analysis, *Phenols), (*Colorimetric analysis, Phenols), (*Spectroscopic analysis, Phensols), Dyes.
Identifiers: Antipyrine/amino, *Water pollution detection.

The use of 4-aminoantipyrine was proposed by Emerson in a new color test for phenols. As outlined by Emerson, the essentials of the reaction consist of bringing together the phenolic material, the 4-aminoantipyrine and an alkaline oxidant in a solution of sufficiently high pH to prevent the formation of antipyrine red. Potassium ferricyanide was recommended as the oxidant. The work to be described has had two goals: Evaluation of the reaction variables which affect usage of Emerson's reagent for the determination of the simpler phenols; and Devising a procedure sufficiently sensitive to detect a one p.p.b. concentration of phenol.

PB-216 760
Environmental Health Center, Cincinnati, Ohio.
STUDY ON SEPTIC TANKS AND SEPTIC TANK DISPOSAL SYSTEMS,
T. W. Bendixen, and S. R. Weibel. 1951, 24p
Presented at the Annual Meeting of the American Society of Agricultural Engineers at Houston, Texas on 19 June 1951.

Descriptors: (*Septic tanks, Reviews).

Septic tank design, installation, and maintenance, and the soil absorption systems thereof, are discussed in the report.

PB-216 761
Environmental Health Center, Cincinnati, Ohio.
TREATMENT OF INDUSTRIAL WASTES IN MUNICIPAL SEWAGE TREATMENT PLANTS,
Hayse H. Black. 1953, 9p
Presented at the Southern Municipal and Industrial Waste Conference (2nd), University of North Carolina, Chapel Hill, N.C. 19 March 1953.

Descriptors: (*Sewage treatment, *Industrial wastes).

The continued search for economical methods for treatment of industrial wastes may be expected to keep combined treatment with domestic sewage ever in the foreground. In addition, there is the intangible aesthetic value of removing waste treatment from the premises of industrial establishments. It is the responsibility of industry to control the process waste discharge to the sewers in such manner that combined treatment is feasible. THIS CONCEPT IS DISCUSSED.

PB-216 762
Environmental Health Center, Cincinnati, Ohio.
STEAM POLLUTION FROM INDUSTRIAL SOURCES. (FUTURE REQUIREMENTS AFFECTING INDUSTRAIL EFFLUENTS),
V. G. MacKenzie. Nov 52, 10p
Presented at the Annual Meeting, Industrial Hygiene Foundation (17th), Pittsburgh, Pa. 19 November 1952.

Descriptors: (*Water pollution, *Industries).
Identifiers: *Water pollution control.

The author concludes that industry has had the initiative and technological competence to create the amazing record of the American economy. It similarly has the technical competence and is best equipped otherwise to solve these problems of waste disposal. From the standpoint of our overall economy and the efficiency of our American civilization, it is best that the job be done largely by industry.

PB-216 837
Federal Water Pollution Control Administration, Kansas City, Mo. Missouri Basin Region.
DEVELOPMENT OF A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE MISSOURI-SOURIS-RED RIVER BASINS.

Jun 66, 13p

Descriptors: (*Missouri River Basin, *Water pollution), (*Souris River Basin, *Water pollution), (*Red River Basin, *Water pollution).

The report discusses a water pollution control plan for the Missouri-Souris-Red River Basins. The objectives are to restore and preserve the quality of surface and ground water to protect public health and to meet the public's desires and expectations for clean water. The program will meet these objectives in a highly efficient manner through systematic application of a combination of water pollution control measures. These measures include: (1) elimination or reduction of pollution at its source; (2) removal of polluting materials from waste water discharges by treatment methods; (3) control of times of release of waste waters to minimize pollutional effects; and (4) after application of treatment and control at the source, by regulation of streamflow for water quality control. (Author Modified Abstract)

PB-216 838
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
PHOSPHORUS REMOVAL WITH ALUMINUM CHLOROHYDRATE,
S. W. Hathaway, J. B. Farrell, J. E. Smith, Jr., and R. B. Dean. Jun 70, 20p

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Sewage treatment, Chemical removal (Sewage treatment)), (*Precipitation (Chemistry), Phosphorus).
Identifiers: *Aluminum chloride hydroxides.

A comparative study was made of the ability of aluminum chlorohydrate to remove phosphate from wastewater. The primary objective of this study was to determine the effect of the proportion of chloride in the chlorohydrate on its ability to remove phosphate.

PB-216 839
Vanderbilt Univ., Nashville, Tenn. Dept. of Sanitary and Water Resources Engineering.
EXPERIMENTAL CONDITIONS IN THE STUDY OF THE PHYSIOLOGICAL ECOLOGY OF ACTIVATED SLUDGE,
John J. Cibulka, and George W. Malaney. May 67, 24p
Grant PHS-WP-00816
Presented at Purdue Industrial Waste Conference (22nd) Held at Lafayette, Ind., May 67.

Descriptors: (*Activated sludge process, Process variables), Oxygen, Nutrients.

The report describes results obtained from research investigations into water reclamation by use of the activated sludge process. The research efforts included the isolation, identification, and propagation of bacteria in activated sludge from a conventional treatment plant, the use of these cultures individually and as mixtures in oxygen uptake studies, and the measurement of content of individual fatty acids in aeration tank influents.

PB-216 840
Bureau of Solid Waste Management, Rockville, Md.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL (IRGRD). INFORMATION BULLETIN NUMBER 21-31 AUGUST 1964 TO DECEMBER 1967.
1969, 376p

Descriptors: (*Waste disposal, Europe), (*Refuse disposal, *Europe).
Identifiers: *Solid waste disposal.

Presented are refuse disposal reports published in the 1964-1967 information bulletins.

PB-216 841
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WASTE INVESTIGATIONS, SEMET-SOLVAY DIVISION, ALLIED CHEMICAL AND DYE CORPORATION, TONAWANDA, NEW YORK. PART I. WASTE SURVEY REPORT. PART II. BIOASSAY INVESTIGATIONS,
H. A. Anderson, and Croswell Henderson. 1956, 45p

Descriptors: (*Niagara River, *Water pollution), (*New York, Water pollution), (*Coking, Water pollution), (*Bioassay, *Industrial wastes), Fresh water fishes, Toxicity, Phenols, Cyanides.
Identifiers: *Water pollution effects (Animals).

During the periods Oct. 28-Nov. 1 and Nov. 7-8, 1956, investigations were conducted to determine the pollutional characteristics of Semet-Solvay oil-gas generator and by-product coke plant wastes which are discharged into the Niagara River. Part I of this report covers a study of waste flows and certain pollutional characteristics in relation to plant operations. Part 2 covers an investigation of the toxicity to fish of some of the plant effluents. (Author)

PB-216 842
Public Health Service, Kansas City, Mo. Region VI.
HEARING AT ST. JOSEPH, MISSOURI CONCERNING POLLUTION OF THE INTERSTATE WATERS OF THE MISSOURI RIVER, 27-30 JULY 1959.
Transcript of hearing.

1959, 423P
Library of Congress Catalog Card No. 73-611631.

Descriptors: (*Missouri River, *Water pollution), (*Missouri, Water pollution), (*Kansas, Water pollution).
Identifiers: *Saint Joseph (Missouri), *Feedlot wastes.

The hearing was called concerning the pollution of interstate waters in the St. Joseph, Missouri, Atchison, Kansas, and Kansas City, Kansas, and Kansas City, Missouri, area by discharges of untreated sewage and industrial wastes by St. Joseph, Missouri and its associated stockyard area.

PB-216 843
Green Bay Metropolitan Sewerage District, Wis.
JOINT TREATMENT OF MUNICIPAL SEWAGE AND PULP MILL EFFLUENTS.

Jul 70, 310p EPA-12130-EDX-07/70
Grant WPRD-60-01-67
Paper copy available from GPO $6.00 as stock no. 5501-0206.

Descriptors: (*Paper industry, *Sewage treatment), (*Industrial waste treatment, Sewage treatment), (*Activated sludge process, Industrial waste treatment), Pilot plants, Cost estimates, Spent liquors (Pulping).
Identifiers: Biological industrial waste treatment.

The report determines the technical and economic feasibility of jointly treating the influent to the present treatment facilities of the Green Bay Metropolitan Sewerage District in combination with the weak effluents from the pulping sections of four local paper mills, specifically American Can Company, Charmin Paper Products Company, Fort Howard Paper Company and Green Bay Packaging, Inc. Four activated sludge processes (conventional, step aeration, contact stabilization, and Kraus) were studied in parallel using 1-gpm pilot plants.

PB-216 844
Public Health Service, San Francisco, Calif. California and Great Basin Drainage Basins Office.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE HUMBOLDT RIVER AND CENTRAL NEVADA BASINS.
Water pollution series.

1953, 11P PHS-Pub-294, PHS-WPS-52
Prepared in cooperation with the Nevada State Dept. of Health, Reno.

Descriptors: (*Humbolt River Basin, *Water pollution), (*Nevada, Water pollution).

The publication summarizes the comprehensive water pollution control program for the humboldt river and central Nevada basins, developed by the Nevada State Health Department, Division of Public Health Engineering. The program is sound and gives full consideration to the several present uses and to the reasonably-anticipated future uses of the waters of the Humboldt River and Central Nevada Basins. It provides an equitable balance in the pollution control requirements for the various private and public groups concerned. (Author Modified Abstract)

PB-216 845
Environmental Health Center, Cincinnati, Ohio.
REPORT OF RESULTS OF SAMPLING THE ATMOSPHERE IN THE DETROIT RIVER AREA DURING 1952,
George D. Clayton, Paul M. Giever, and Harold W. Baynton. 1 Jan 54, 171p

Descriptors: (*Air pollution, *Michigan).
Identifiers: *Air quality data.

A Reference signed on January 12, 1949 required a comprehensive air pollution investigation in the Detroit River area. To answer the questions in the Reference, the following objectives were established to (1) determine the sources, nature and amounts of atmospheric contaminants resulting from combustion of fuels, (2) determine the sources, nature and amounts of atmospheric contaminants resulting from industrial processes, (3) determine the effects of meteorological factors on the dissemination and diffusion of atmospheric contaminants, (4) determine the effect of the atmospheric contaminants upon (a) health, (b) vegetation, (c) safety, and (d) economy, and (5) determine controls necessary (vessels only). (a) Cost, and (b) by whom should the cost be borne. The report presents the environmental and meteorological findings obtained in 1952 and correlation of these data with those obtained in 1951.

PB-216 846
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE IDENTIFICATION OF ALIPHATIC AMINES IN AIR AS THEIR BENZAMIDES BY PAPER CHROMATOGRAPHY,
John P. Lodge, Jr., and E. D. Barber. 1959, 10p

Descriptors: (*Amines, *Chromatographic analysis), Benzamides, Carbon 14.
Identifiers: *Paper chromatography.

As a portion of a program of the study of individual species in collections from polluted atmospheres, it was felt desirable to develop a method for the separation and identification of aliphatic amines. It was decided that an investigation should be made of the possible use of the benzamides as suitable derivatives for paper chromatography. To extend the lower limit of such a technique, carbon-14 labelling was used.

PB-216 847
Minnesota Univ., Minneapolis. School of Public Health.
BENTHONIC INVERTEBRATES AS AN INDEX OF WATER QUALITY.
Progress rept. Sep 62-Sep 64,
Theodore A. Olson, and Myrtle E. Rueger. Sep 64, 56p
Grant PHS-WP-320

Descriptors: (*Benthos, *Aquatic animals), (*Indicator species, *Water pollution), (*Ecology, Benthos), Invertebrates, Oxygen.

The long term goal of the project is the evaluation of the ecology of benthic invertebrates which may be useful as indicators of water quality or as indicator organisms in bioassay studies. The present study determines the individual oxygen consumption rates of common benthic invertebrates. It was decided that the Warburg apparatus would be used to make preliminary respiratory studies on aquatic invertebrates. By using the same individuals of members of the same species in the Warburg apparatus and the flow-through electro-chemical system, a comparison was made of the two systems.

PB-216 849
California Univ., Berkeley. School of Public Health.
TRAVEL OF SYNTHETIC DETERGENTS WITH PERCOLATING WATER.
Annual rept. no. 2,
Stephen A. Klein, David Jenkins, and P. H. McGauhey. 30 Dec 62, 67p

Grant PHS-WP-207-C2

Descriptors: (*Biodeterioration, Detergents), (*Sulfonates, Plant growth), (*Surfactants, Plant growth), (*Plant growth, *Detergents), Soil chemistry, Percolation, Inhibitors.
Identifiers: *Water pollution effects (Plants).

The rapid rise of population in the United States, with a framework of urban-industrial economy dependent on the water-transport of wastes, foretells an ever-increasing proportion of its over-all water resources will be used water. Alarm has been rising over the presence of refractory materials in waste waters; and alkylbenzenesulfonate (ABS) has been the object of most investigative work. In the western United States the fate of ABS in soils is of more than academic importance. Substitution of sewage or sewage effluents for the normal source of irrigation water, poses the question of whether the value of the water in sewage and sewage effluents is in any way decreased by its contaminants. The experiments described concern maximizing the ABS-degradation capabilities of soils involved laboratory-scale column studies and studying the effect of ABS on plant growth, and the uptake by plants.

PB-216 850
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INDUSTRIAL WASTE TREATMENT, ORIGIN AND CHARACTER OF INDUSTRIAL WASTES,
Hayse H. Black. 1960, 6p

Descriptors: (*Industrial waste treatment, Reviews).
Identifiers: *Water pollution control.

The report is an outline defining objectives of industrial waste surveys, factors influencing wastes, separate treatment of industrial wastes, combined treatment of industrial and domestic wastes, and the importance of research in waste treatment problems.

PB-216 851
Pittsburg Coke and Chemical Co., Pa. Research and Development Div.
A NONSELECTIVE COLLECTOR FOR SAMPLING GASEOUS AIR POLLUTANTS.
Final technical rept.,
Stanton B. Smith, and Richard J. Grant. 1959, 69p
SEC-TR-A59-3
Contract SAph-68345

Descriptors: (*Air pollution, *Samplers), (*Gas sampling, Air pollution), Activated carbon.
Identifiers: *Air pollution detection.

The problem of collecting field samples of gaseous atmospheric contaminants has been investigated and a prototype collector design proposed which consists of two activated carbon columns in series, the second of which is refrigerated in dry ice. A field collector kit containing all accessory equipment for collecting 100-liter samples was designed and built. (Author Modified Abstract)

PB-216 852
Public Health Service, Washington, D.C.
CONCEPTS OF RADIOLOGICAL HEALTH. PART I. RADIATION PRODUCTION AND ABSORPTION, PART II. BIOLOGIC EFFECTS OF RADIATION ABSORPTION,
Samuel C. Ingraham, II, James G. Terrill, Jr., and Dade W. Moeller. Jan 54, 55p PHS-Pub-336

Descriptors: (*Radiobiology, Reviews), (*Public health, Radiobiology).

The manual is addressed to public health administrators who, without special training in physics, recognize the importance of learning the elementary facts about the impact of the atomic age on health. Its purpose is twofold: To provide a concise yet elementary discussion of radiological health, and To serve as a source book for Public Health Service Regional Consultants in preparing short lectures and brief courses in radiological health. (Author)

PB-216 853
Public Health Service, Washington, D.C. Div. of Air Pollution.
THE EFFECTS OF AIR POLLUTION.
1966, 20p PHS-Pub-1556
Identifiers: *Air pollution effects (Animals), *Air pollution effects (Plants), *Air pollution effects (Humans), *Air pollution effects (Materials).

The report describes briefly the types of air pollutants, where and how they occur, and their effects on humans, other animals, plants and materials.

PB-216 854
Public Health Service, Washington, D.C. Div. of Sanitation.
PLUMBING AND PUBLIC HEALTH: A BIBLIOGRAPHY.

1 Jul 48, 44p

Descriptors: (*Plumbing, *Public health), (*Bibliographies, Plumbing).

This bibliography of plumbing and public health contains 531 references.

PB-216 855
Oak Ridge National Lab., Tenn.
RADIOACTIVE MATERIALS AND THEIR EFFECTS ON ENVIRONMENTAL HEALTH,
Conrad P. Straub. 1951, 36p
Contract W7405-eng-26

Descriptors: (*Public health, *Ionizing radiation), Radiation hazards, Radiation dosage, Permissable dosage, Radiotherapy, Radioactive isotopes, Water pollution, Air pollution.
Identifiers: *Radioecology.

Ionizing radiations result from the disintegration of unstable nuclei, and it is these radiations that are damaging to living tissue. The irradiation in which one is interested may originate from an external source or from radioactive materials within the body. Radiation effects from radioactive materials within the body depend upon several factors: the quantity of radioactive material absorbed in the body; the type of radiation, whether alpha, beta, gamma, etc.; the energy; the point of localization; the rate of excretion from the body; and the half-life of rate of decay of the material. All of these factors are considered in evaluating the maximum permissible concentration (MPC) for each radioisotope in water or air. The MPC values under consideration for release by the Subcommittee on Internal Dose of the National Committee on Radiation Protection are indicated.

PB-216 856
Environmental Health Center, Cincinnati, Ohio.
ANNUAL REPORT FOR FISCAL YEAR 1949.

1973, 53p

Descriptors: (*Water pollution, Research).

The report describes the research conducted by the Environmental Health Center in 1949.

PB-216 857
Public Health Service, New York. North Atlantic Drainage Basins Office.
NORTH ATLANTIC DRAINAGE BASINS: A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series summary rept.
1951, 155P PHS-Pub-111, PHS-WPS-10

Descriptors: (*United States, *Water resources), (*Water pollution, *Northeast United States).

The report presents information about the ways our water resources are used, the pollution going into our water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required. Part one considers the water pollution problems of the basins as a whole. Part two presents briefly the data for each of the several sub-basins of the major basins, including a list of projects now known to be needed for water pollution control.

PB-216 858
National Center for Urban and Industrial Health, Cincinnati, Ohio.
FEASIBILITY AND MASS, OUTDOOR CULTIVATION OF GONYAULAX CATENELLA,
Joseph M.Cummins, Clarence L. Law, and William F.Hill, Jr. 15 Jul 66, 25p PHS-Pub-999-UIH-3

Descriptors: (*Shellfish, *Toxins and antitoxins), (*Dinoflagellata, *Cultivation), Plant growth, Marine biology.

The object of the study was to determine the feasibility of mass culturing Gonyaulax catenella outdoors, in an enriched sea water medium, utilizing natural sunlight, and controlling temperature and initial pH. The marine dinoflagellate, Gonyaulax catenella, has been definitely shown to be a source of a toxin, that when concentrated in shellfish during feeding, can subsequently cause paralytic shellfish poisoning when ingested by humans. Thus its laboratory growth is important as a source of supply.

PB-216 859
Public Health Service, Washington, D.C. Div. of Air Pollution.
PROCEEDINGS OF NATIONAL CONFERENCE ON AIR POLLUTION HELD IN WASHINGTON, D.C. 10-12 DEC 62.
1963, 447p PHS-Pub-1022

Descriptors: (*Air pollution, *Meetings).

Contents: Statesmanship in air pollution control; Problem areas the public asks about; The automobile, the truck, and the bus; The industrial plant, the powerplant, and the municipality; Health considerations; Agricultural, natural resource, and economic considerations; Applying present know-how to air pollution control--Applying our measuring and monitoring know-how; Applying our control equipment and meteorological control know-how; Applying our legislative and regulatory know-how; Applying our public information and sociological know-how.

PB-216 860
Public Health Service, Washington, D.C. Bureau of State Services.
AN INDUSTRIAL WASTE GUIDE TO THE MEAT INDUSTRY.
1943, 17p PHS-Pub-386

Descriptors: (*Food processing, *Water pollution), Industrial wastes, Livestock, Beef cattle, Swine.
Identifiers: *Slaughtering house wastes, *Rendering plants.

The report represents the efforts of waste technologists of the meat industry and others to develop a concise practical guide for operating and design personnel. Reduction of wastes at their source is the initial objective of control measures. Appreciable reduction of waste can be accomplished through waste prevention measures carried out within the meat processing plant. Some performance data are presented on the more usual

as well as the more recently developed meat processing waste treatment processes.

PB-216 861
Minnesota Univ., Minneapolis. Dept. of Mechanical Engineering.
GENERATOR FOR PRODUCING HIGH CONCENTRATIONS OF SMALL IONS.
Technical rept.,
K. T. Whitby, A. R. McFarland, and D. A. Lundgren. Jul 60, 59p TR-12
Grant PHS-S-23

Descriptors: (*Ion sources, Design).

A novel free ion generator capable of producing high concentrations of light ions with high efficiency has been developed. The generator is capable of producing positive, negative or an equal mixture of positive and negative ions. During the course of development of a generator for making homogenous aerosols from methylene blue by the evaporation of alcohol or water solutions of the dye, it was found that the generated particles were highly charged under certain conditions. It was eventually found that the only practical method for neutralizing these particle charges was by mixing the particles with a high concentration of mixed positive and negative small ions. The report describes the ion generator used to neutralize these particle charges. (Author Modified Abstract)

PB-216 862
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BIO-ASSAY INVESTIGATIONS, SOCONY MOBIL OIL COMPANY, BUFFALO, NEW YORK,
Croswell Henderson, and H. A. Anderson. 1956, 19p

Descriptors: (*Buffalo River, *Water pollution), (*Refineries, Water pollution), (*Bioassay, *Industrial wastes), (*New York, Water pollution), Fresh water fishes.
Identifiers: *Water pollution effects (Animals).

In January 1956, field studies were initiated on a cooperative basis to determine the possible effects of industrial wastes from major Buffalo River industries on the eastern end of Lake Erie and the Niagara River. Buffalo River industries cooperating in this project were National Aniline Division, Allied Chemical and Dye Corporation, Donner-Hanna Coke Corporation, and Socony-Mobil Company. The report covers an investigation of the toxicity to fish of intake waters and major effluents from the Socony-Mobil Oil Company. Refinery wastes contain some chemical compounds which are known to be toxic to aquatic life in relatively low concentration. Bio-assays were made to evaluate directly the toxicity of these complex wastes.

PB-216 863
Public Health Service, San Francisco, Calif. Pacific Southwest Drainage Basins Office.
REPORT ON WATER POLLUTION CONTROL. LITTLE COLORADO RIVER DRAINAGE BASIN. ARIZONA-NEW MEXICO.
Water pollution series.

Apr 73, 57p PHS-Pub-250, PHS-WPS-43

Descriptors: (*Little Colorado River Basin, *Water pollution), (*Arizona, Water pollution), (*New Mexico, Water Pollution).

The report is based upon data available as of January 15, 1953, and has been compiled through and in cooperation with the state water pollution control agencies, but should not be considered a detailed engineering investigation of the Little Colorado Sub-Basin. The sub-basin report present information about the ways the water resources of the area are used, the pollution entering these water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, pollution prevention measures not in effect, and those which appear to be needed.

PB-216 864
Sanitary Engineering Center, Cincinnati, Ohio.
WATER QUALITY DATA - AN INCREASING NATIONAL NEED,
Ralph C. Palange, and Stephen Megregian. 1958, 13p

Descriptors: (*Water analysis, *United States), (*Water pollution, United States), Monitors.
Identifiers: *Water pollution sampling.

The objective of the described research has been the establishment of 50 water sampling stations on the Great Lakes and interstate streams of the United States. At each of these stations, samples of raw water are being collected periodically and analysed for radioactivity, organic chemical content, plankton populations, coliform organisms, and the conventional physical and chemical determinations.

PB-216 865
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
DISPOSAL OF CHEMICAL SLUDGES AND BRINES,
Robert B. Dean. May 70, 10p
Presented at the Symposium on Coal Mine Drainage Research (3rd) Held at Mellon Inst., Pittsburgh, Pa., 19-20 May 70. Sponsored in part by the Ohio River Valley Water Sanitation Commission.

Descriptors: (*Water pollution, *Mine waters), (*Industrial waste treatment, Mine waters), Dewatering, Sludge disposal.
Identifiers: *Mine acid drainage.

The disposal of pollutants in mine drainage is difficult because they are diluted with so much water. Sale of extracted pollutants is not economical. Acid can be neutralized but sulfates are left in solution. Iron can be precipitated but the precipitate is one of the most difficult to dewater. Ultimate disposal of solids will be to the land, either in dumps or spread thinly on pasture or woodland. Brines too strong to be accepted in surface waters must go to permanent storage or to the ocean. The paper has reviewed available processes for dealing with mine drainage and points out difficulties and advantages associated with them. (Author)

PB-216 866
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
PHYSICAL-CHEMICAL TREATMENT OF MUNICIPAL WASTEWATER,
Dolloff F. Bishop, Thomas P. O'Farrell, and John B. Stamberg. Oct 70, 40p
Presented at the Annual Conference of the Water Pollution Control Federation (43rd) at Boston, Mass., 4-9 Oct 70.

Descriptors: (*Sewage treatment, Design).
Identifiers: *Physical chemical treatment.

Physical-chemical treatment of the District of Columbia raw wastewater in a 100,000 gal/day pilot plant with a 3.2:1 diurnal flow variation is described and consisted of two-stage lime precipitation with intermediate recarbonation, filtration, pH control, ion exchange, and carbon adsorption. The complete system removed 98% of the phosphorus, 95% of the organics and 78% of the total nitrogen. (Author Modified Abstract)

PB-216 867
Rutgers - The State Univ., New Brunswick, N.J. Dept. of Environmental Science.
ADAPTATION BY MICROBIAL POPULATIONS.
Progress rept., 1 Sep 65-15 Jan 66,
Norman C. Dondero, and T. B. S. Prakasam. 1966, 71p
Grant PHS-WP-00645-03

Descriptors: (*Sludge, *Culture media).

Cultural studies of the general flora of activated sludge require a medium as non-selective as can be accomplished. In the present investigation, culture media for obtaining maximal bacterial counts of activated sludge and sewage were evaluated. In these studies, the viable counts of settled sewages and activated sludges from three treatment plants were compared on several agar culture media. In the report's descriptions of plating experiments, the activated sludge extract (ASE) agars were inoculated with portions of the same sample of activated sludge from which the extracts were prepared.

PB-216 868
Federal Water Pollution Control Administration, Washington, D.C.
BUILDING FOR CLEAN WATER 1965.
1965, 15p
A Report on Federal Incentive Grants for Municipal Waste Treatment and Future Construction Needs.

Descriptors: (*Water pollution, *Project planning), Grants, National government.

The report briefly describes the Federal Incentive Grants program for municipal waste treatment in terms of available money, eligibility, accomplishments, and present and future needs.

PB-216 869
National Center for Urban and Industrial Health, Cincinnati, Ohio.
SWIMMING POOLS AND NATURAL BATHING PLACES, AN ANNOTATED BIBLIOGRAPHY, 1957-1966.
1966, 55p PHS-Pub-1586

Descriptors: (*Swimming pools, *Bibliographies), Water treatment, Design, Regulations.

The bibliography is intended for use by health and recreation authorities and others responsible for the construction, operation, and maintenance of swimming pools and natural bathing places. (Author)

PB-216 870
Public Health Service, New York. North Atlantic Drainage Basins Office.
SUSQUEHANNA RIVER BASIN - JUNIATA RIVER. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION CONTROL.
Water pollution series.
May 51, 77p PHS-Pub-251, PHS-WPS-44
Prepared in cooperation with Pennsylvania Department of Health, Philadelphia.

Descriptors: (*Juniata River, *Water pollution), (*Susquehanna River Basin, *Water pollution), (*Pennsylvania, Water pollution).

The report describes the status as of May 1951 of the comprehensive water pollution control program conducted by the Pennsylvania Sanitary Water Board in the Juniata River Basin, a subbasin of the Susquehanna River Basin. It sets forth information about the ways the water resources of the area are used, the pollution entering those water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, pollution prevention measures in effect, and those which appear to be needed. Its

scope is limited to surface water pollution control. Ground water pollution has not been considered in the report although usage of ground water is mentioned. (Author)

PB-216 871
Oak Ridge National Lab., Tenn.
DISPOSAL OF RADIOISOTOPES - A METHOD OF EVALUATING POTENTIAL HAZARD,
Conrad P. Straub. 1973, 28p

Descriptors: (*Radioactive isotopes, *Hazards).

Brief mention is made of techniques now in use for determining radioisotope hazard. A study was made of data available from the Operations Division, Oak Ridge National Laboratory on radioisotope shipments. Since the number of curies of each radioisotope shipped are known and the maximum permissible concentration for that radioisotope has been suggested, the volume of water required for dilution to the tolerance concentration could be determined. These computations, which were based on several stated assumptions and included the effects of decay, show that there is immediate need for setting standards and procedures for the safe handling and disposal of strontium and perhaps other long-lived radioisotopes. (Author)

PB-216 872
Public Health Service, Cincinnati, Ohio.
PLANNING THE ORGANIZATION AND CONDUCT OF STREAM POLLUTION SURVEYS,
J. K. Hoskins. 1973, 13p
Presented at the Ohio Conference on Sewage Treatment, Cincinnati, Ohio, 19-20 Oct 37.

Descriptors: (*Water pollution, *Environmental surveys).

The report describes surveys to determine the sanitary condition of polluted streams including securing specific information to ascertain: The nature and extent of nuisance conditions resulting from odors, sludge deposits along channels and shore lines, floating sleek, grease and oil and objectionable discolorations and aquatic growths, Suitability of the stream waters for public or industrial water supply, the capacity of the watercourse for sewage or industrial waste dilution, ability to support fish and other aquatic life, safety for recreational use, general relationships of pollutional factors for application to a variety of specific conditions.

PB-216 873
Environmental Health Center, Cincinnati, Ohio.
SUMMARY REPORTS OF CO-OPERATIVE INDUSTRIAL WASTE SURVEYS FOR INTERNATIONAL JOINT COMMISSION.
Rept. for Apr-Jun 53,
Dean M. Taylor. Jun 53, 21p

Descriptors: (*Michigan, *Water pollution), Phenols, Industrial wastes, Detroit River, Saint Clair River, Rouge River, Canada.

The report describes the industrial waste products of five Michigan industries and presents statistical data relative to their water pollution contribution and methods used to alleviate this pollution.

PB-216 874
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
MORPHOLOGICAL IDENTIFICATION OF SOME ORGANIC ACIDS AS THE SODIUM SALTS,
Bernice R. Havlik, Lawrence M. Marshall, and James P. Lodge, Jr. 1958, 6p

Descriptors: (*Aliphatic acids, *Crystal growth), Organic salts, Diffusion.

In a previous investigation of the characterization of organic acids by quantitative microdiffusion it was observed that a number of the acids gave large characteristic crystals of the sodium salts as a result of the diffusion process. These crystals can serve to confirm the identity of the diffusing acid, as well as provide, by their speed of formation, a rough index of the diffusion rate. The technique may also be used to prepare large crystals of the sodium salts of the acids. The report very briefly discusses results from a study of the diffusion of aliphatic organic acids in sodium hydroxide pellets.

PB-216 875
Public Health Service, Washington, D.C.
MISSISSIPPI-IOWA-CEDAR RIVERS BASIN: A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM.
1954, 44p PHS-Pub-346 WP-61

Descriptors: (*Cedar River Basin, *Water pollution), (*Mississippi River Basin, *Water pollution), (*Iowa River Basin, *Water pollution), (*Iowa, Water pollution).

The report, prepared in cooperation with the water pollution control agencies of Iowa, Illinois, and Minnesota, sets forth the water pollution control program being followed by the respective States in the Mississippi-Iowa-Cedar Rivers Basin. This program, which is based on data available as of July 1, 1953, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed. (Author Modified Abstract)

PB-216 876
California Univ., Berkeley. Sanitary Engineering Research Lab.
TRAVEL OF SYNTHETIC DETERGENTS WITH PERCOLATING WATER.
Annual rept. no. 3,
Stephen A. Klein, and P. H. McGauhey. Feb 64, 42p SERL-64-2
Grant PHS-WP-207

Descriptors: (*Septic tanks, *Surfactants), Sulfonates, Detergents.

The report discussed to what degree detergents are removed from wastes passing through septic tanks and attendant percolation systems. Detectable concentrations of ABS in ground waters demonstrate that degradation is incomplete. Furthermore, frothing of water obtained from wells in sewage-polluted strata is not an uncommon occurrence. It is therefore important to study the interrelationships of synthetic detergents and septic-tank systems.

PB-216 877
Federal Water Pollution Control Administration, Boston, Mass. Northeast Region.
REPORT ON IMMEDIATE WATER POLLUTION CONTROL NEEDS, INTERSTATE WATERS. NEW ENGLAND RIVER BASINS, NORTHERN AREA.
Jun 67, 208p
Report on New England River Basins Comprehensive Water Pollution Control Program.

Descriptors: (*New England, *Water pollution).

The report presents guidelines for an evaluation of the initial phases of a comprehensive action water pollution control and water quality management program for the New England River Basins. The report's objectives are to delineate areas of present water quality problems, actions required to improve water quality, and estimated costs to implement the required actions. (Author)

PB-216 878
Environmental Protection Agency, Washington, D.C.
BASIC RADIOLOGICAL HEALTH.
1958, 304p

Descriptors: (*Radioactivity, *Manuals), (*Radiation dosage, Manuals).

The report reviews the following topics: Sources of exposure; Atomic structure; Radioactivity; Series decay; Radiation interactions; Radiation detection; Personnel instruments; Nuclear counting statistics; Exposure; Protection; X rays; Nuclear reactions; Fallout; and other related topics.

PB-216 879
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
PHYSICAL-CHEMICAL TREATMENT FOR WASTEWATER,
J. M. Cohen, and I. J. Kugelman. 1972, 7p
Pub. in Water Research, v6 p487-492 1972.

Descriptors: (*Sewage treatment, *Activated carbon treatment).
Identifiers: *Physical chemical treatment.

The report describes a system of physical-chemical wastewater treatment, surveys the performance of some pilot plants, and gives cost estimates for various size plants.

PB-216 881
Consumer Protection and Environmental Health Service, Washington, D.C.
SUMMARIES OF SOLID WASTES RESEARCH AND TRAINING GRANTS - 1968,
Louis W. Lefke. 1968, 56p PHS-Pub-1596-Fev-68
Library of Congress Catalog card no. 86-62136.

Descriptors: (*Waste disposal, *Research), (*Grants, Waste disposal).
Identifiers: *Solid waste disposal.

The publication is a compendium of solid wastes research and training grants supported by the Environmental Control Administration, Consumer Protection and Environmental Health Service, extending and updating through December 31, 1967, the previous issuance, PHS Publication No. 1596. The purpose of this review is to briefly inform interested readers of solid wastes research projects and training programs. It is hoped that the publication may stimulate some readers to conceive new approaches or modifications of existing practices which, through research and development, will lead to better methods of solid wastes treatment, reuse, and disposal from all national sectors--municipal, industrial, commercial and agricultural sources. (Author Modified Abstract)

PB-216 882
Environmental Health Center, Cincinnati, Ohio.
DEVELOPMENTS IN HOME SEWAGE DISPOSAL,
S. R. Weibel. 1952, 18p
Presented at the Short School for Public Health Engineers and Sanitarians, sponsored by Georgia Dept. of Public Health and Georgia Inst. of Technology, Atlanta, Ga., 18 Mar 52.

Descriptors: (*Septic tanks, Reviews).

The report describes the evolution of residential sewage disposal systems and evaluates various configurations of septic tanks and tank installations.

PB-216 883
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
RADIOACTIVE CONTAMINATION AS A FACTOR IN STREAM SANITATION STUDIES,
O. W. Kochtitzky, Jr., and Oliver R. Placak. 31 Aug 50, 23p

Descriptors: (*Water pollution, *Radioactive contaminants), Reviews.

Several problems and needs in investigating wastes containing radioactive materials are discussed. These include possible unavailability of data at the source, lack of knowledge of many physiological and biological factors involved in permissible concentrations, undeveloped or unstandardized analytical techniques, the ultimate fate in nature of the materials, and personnel training.

PB-216 884
National Center for Urban and Industrial Health, Cincinnati, Ohio.
STUDY OF PESTICIDES IN SHELLFISH AND ESTUARINE AREAS OF LOUISIANA,
R. J. Hammerstrom, R. T. Russell, R. M. Tyo, E. A. Robertson, Jr., and J. L. Gaines. 1967, 31p
PHS-Pub-999-UIH-2
Prepared in cooperation with the Gulf Coast Shellfish Sanitation Research Center, and Federal Water Pollution Control Administration.

Descriptors: (*Pesticides, *Shellfish), (*Water pollution, Pesticides), (*Louisiana, Water pollution), Fisheries, Estuaries, Seafood, Public health, DDT, Dieldrin, Endrin.

The major interest in this study was concerned with the findings of endrin and dieldrin in the various types of samples analyzed. Special attention was also given to the frequency and levels of concentration at which DDT and its metabolites DDD and DDE were found. The highest levels of concentration of these pesticides are summarized for the entire study for all samples of each type. The results of the laboratory analyses of all oyster, water, and bottom sediment samples collected during the entire study showed that, in general, chlorinated pesticides were either not detected or were found in very low levels. The amounts of the pesticide residues found by the Food and Drug Administration were reported as insignificant from a health standpoint. (Author Modified Abstract)

PB-216 885
Public Health Service, Cincinnati, Ohio. Bureau of Disease Prevention and Environmental Control.
PROCEDURE FOR THE STANDARDIZATION AND CERTIFICATION OF FOOD-SERVICE SANITATION SURVEY OFFICERS.
1967, 7p PHS-Pub-1630

Descriptors: (*Food sanitation, *Personnel development).

The document sets forth procedures to be followed by the Public Health Service for standardizing and certifying food-service sanitation survey officers. The procedure may also be used by a certified food-service sanitation survey officer within his own State for training local food-service sanitation personnel in proper inspection techniques and interpretation of sanitation requirements. (Author)

PB-216 886
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
USE OF STABILIZATION PONDS IN TREATING SEWAGE AND INDUSTRIAL WASTES,
W. W. Towne, and H. R. Pahren. 1959, 20p
Presented at Southern Municipal and Industrial Waste Conference (8th), Chapel Hill, 2-3 Apr 59.

Descriptors: (*Industrial waste treatment, *Lagoons (Ponds)), (*Sewage treatment, *Lagoons (Ponds)).
Identifiers: *Aeration ponds.

The report describes the evolution and effectiveness of stabilization ponds used for treatment of raw sewage and industrial wastes in the United States.

PB-216 887
Maine Univ., Orono. Dept. of Chemical Engineering.
USE OF CHEMICAL ADDITIVES TO IMPROVE AERATION RATES.
Progress rept. no. 1,
Stefan A. Zieminski. 1965, 43p R-248

Descriptors: (*Aeration, *Mass transfer), (*Dissolving, Aeration), Dissolved gases, Oxygen, Carboxylic acids, Additives, Bubbles.

The mass transfer of oxygen from air bubbles to water is of considerable practical importance in treatment of sewage by bio-oxidation and in many industrial fermentation processes. The cost of this operation is comparatively high because large quantities of air have to be compressed to the pressure of the system and dispersed into small bubbles. To obtain more information on this action it was proposed to conduct a preliminary investigation of the effects of three homologous series of organic compounds on the size of air bubbles, mass transfer coefficient, and on the interfacial areas of air-water dispersions. The series of compounds selected for investigation were the mono- and di-carboxylic acids and aliphatic alcohols. This was done in order to determine the possible effects of the type of the compound and its molecular size. Some tests on carboxylic acids, obtained in our previous work, are also discussed in the report. (Author Modified Abstract)

PB-216 888
National Center for Urban and Industrial Health, Cincinnati, Ohio.
ABSTRACTS SELECTED PATENTS ON REFUSE HANDLING FACILITIES FOR BUILDINGS,
John A. Connolly. 1968, 303p PHS-Pub-1793

Descriptors: (*Patents, Waste disposal), (*Buildings, Waste disposal), (*Materials handling equipment, *Waste disposal), Balers, Compacting, Crushers, Grinders.
Identifiers: *Solid waste disposal.

Contents:
- Baling machines;
- Bulk presses;
- Chutes--refuse;
- Crushers and domestic compactors;
- Grinders;
- Holders--disposable sacks;
- On-site compactors;
- Receptables--litter, commercial and municipal;
- Receptacles--domestic, supports, racks, and holders;
- Receptacles--domestic, wheeled, can storage, and sunken;
- Refuse vehicles--detachable containers;
- Miscellaneous.

PB-216 889
Environmental Health Center, Cincinnati, Ohio.
ARKANSAS - WHITE - RED FIELD STUDIES. ARKANSAS RIVER: SAND SPRINGS, OKLA., TO WEBBERS FALLS, OKLA. LITTLE ROCK, ARKANSAS, TO PINE BLUFF, ARKANSAS. OUACHITA RIVER: ARKADELPHIA, ARKANSAS, TO RICHARDSON'S FERRY, ARKANSAS. CAMDEN, ARKANSAS, TO COLUMBIA, LOUISIANA,
James P. Sheehy and Joseph B. Anderson. Aug 53, 201p

Descriptors: (*Arkansas River, *Water pollution), (*Oklahoma, Water pollution), (*Arkansas, Water pollution).
Identifiers: *Water quality data.

The studies were divided into four surveys which include: Arkansas River - Sand Springs, Oklahoma, to Webbers Falls, Oklahoma; September 22 - October 10, 1952; Arkansas River - Little Rock, Arkansas, to Pine Bluff, Arkansas; July 14 - July 24, 1952; Ouachita River - Arkadelphia, Arkansas, to Richardson's Ferry, Arkansas; July 28 - August 2, 1952; Ouachita River - Camden, Arkansas, to Columbia, Louisiana; August 5 - September 10, 1952. The primary objectives of the studies were to obtain data on river water quality, especially regarding dissolved oxygen content, chloride content, biochemical oxygen damand, and bacteriological quality for the purpose of determining the pollutional effects of municipal and industrial wastes discharged to the streams. (Author Modified Abstract)

PB-216 890
Public Health Service, Washington, D.C.
REPORT ON SANITARY SURVEY OF MAURICE RIVER AND COHANSEY CREEK WITH SPECIAL REFERENCE TO POLLUTION OF OYSTERS,
J. K. Hoskins. 11 Dec 15, 28p
Availability: Available in Microfiche only.

Descriptors: (*Maurice River, *Water pollution), (*Cohansey Creek, *Water pollution), (*New Jersey, Water pollution), Oysters.

Sanitary surveys of the Maurice and Cohansey Rivers, draining a portion of the southern part of the State of New Jersey, were made by the United States Public Health Service, with the assistance of, and in co-operation with, the New Jersey State Department of Health, to determine, if possible, the sources of pollution of these streams, resulting in the reported contamination of oysters handled in the waters near the mouths of these two rivers. (Author)

PB-216 891
Communicable Disease Center, Atlanta, Ga.
COMMUNICABLE DISEASE CENTER 1951-1952 ACTIVITIES.
1953, 49p PHS-Pub-302

Descriptors: (*Infectious diseases, Research).

Contents:
- General activities: (Epidemic intelligence service, Airborne disease studies, Disease vector problems associated with water developmental projects, Health hazards of economic poisons, Insecticidal resistance of vectors of disease, Control of animal reservoirs of disease);
- Activities directed toward specific diseases or problems: (Amebiasis, Brucellosis, Conjunctivitis, Disinsectization of aircraft, Dysentery-diarrhea (Fly control), Encephalitis, Histoplasmosis, Infectious hepatitis, Leprosy control, Malaria, Murine typhus, Plague, Poliomyelitis (Fly control), Q fever, Rabies, Rice field mosquitoes, Sarcoidosis, Tick-borne diseases, Trachoma).

PB-216 892
Public Health Service, Washington, D.C.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. CALIFORNIA. A COOPERATIVE STATE-FEDERAL REPORT.
1958, 67p

Descriptors: (*Water supply, *California), Inventories.

The volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. In a few States, places smaller than this size have been reported, and in one or two others the minimum size has been somewhat greater. The listing is alphabetic by name of place within the State. (Author)

PB-216 893
Public Health Service, Washington, D.C.

MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. NEVADA. A COOPERATIVE STATE-FEDERAL REPORT.
1958, 8p

Descriptors: (*Water supply, *Nevada), Inventories.

The volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. In a few States, places smaller than this size have been reported, and in one or two others the minimum size has been somewhat greater. The listing is alphabetic by name of place within the State. (Author)

PB-216 894
Public Health Service, Washington, D.C.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. HAWAII. A COOPERATIVE STATE-FEDERAL REPORT.
1958, 10p

Descriptors: (*Water supply, *Hawaii), Inventories.

The volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. In a few States, places smaller than this size have been reported, and in one or two others the minimum size has been somewhat greater. The listing is alphabetic by name of place within the State. (Author)

PB-216 895
Public Health Service, Washington, D.C.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. OREGON. A COOPERATIVE STATE-FEDERAL REPORT.
1958, 18p

Descriptors: (*Water supply, *Oregon), Inventories.

The volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. In a few States, places smaller than this size have been reported, and in one or two others the minumum size has been somewhat greater. The listing is alphabetic by name of place within the State. (Author)

PB-216 896
Public Health Service, Washington, D.C.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. WASHINGTON. A COOPERATIVE STATE-FEDERAL REPORT.
1958, 23p

Descriptors: (*Water supply, *Washington (State)), Inventories.

The volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. In a few States, places smaller than this size have been reported, and in one or two others the minimum size has been somewhat greater. The listing is alphabetic by name of place within the State. (Author)

PB-216 900
National Center for Radiological Health, Rockville, Md.
BULLETIN OF COURSES, JANUARY 1968 TO JULY 1969, NATIONAL CENTER FOR RADIOLOGICAL HEALTH, TRAINING AND MANPOWER DEVELOPMENT PROGRAM.
1969, 39p PHS-Pub-1633-rev.

Descriptors: (*Radiobiology, *Education).

Contents: Information for applicants; Regional offices; Chronological schedule of courses; Course descriptions; National Center for Air Pollution Control courses; National Communicable Disease Center courses; National Center for Urban and Industrial Health courses.

PB-216 901
Public Health Service, Washington, D.C.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. ALASKA. A COOPERATIVE STATE-FEDERAL REPORT.
1958, 8p

Descriptors: (*Water supply, *Alaska), Inventories.

The volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. In a few States, places smaller than this size the minimum size has been somewhat greater. The listing is alphabetic by name of place within the State. (Author)

PB-216 902
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
POLLUTION OF INTERSTATE WATERS OF THE MISSISSIPPI RIVER IN THE ST. LOUIS METROPOLITAN AREA,
F. W. Kittrell. Feb 58, 32p
Prepared in cooperation with Missouri State Div. of Health, Illinois State Sanitary Water Board, and the Bi-State Development Agency of the Missouri-Illinois Metropolitan Area.

Descriptors: (*Mississippi River, *Water pollution), (*Missouri, Water pollution), (*Illinois, Water pollution).
Identifiers: *Saint Louis (Missouri), *Water quality data.

Following the request to the Surgeon General of the Public Health Service for a conference on Water Pollution in the St. Louis Area, it was decided that information contained in the Bi-State Development Agency Report, 'Mississippi River Water Pollution Investigation, St. Louis Metropolitan Area' should be supplemented by bringing it up to date and expanding the analysis of data. This report was prepared from data in the Bi-State report and from available information in files of interested agencies concerned with the interstate waters of the area. (Author)

PB-216 903
National Center for Air Pollution Control, Washington, D.C.
PROCEEDINGS: THE NATIONAL CONFERENCE ON AIR POLLUTION (3RD) HELD IN WASHINGTON, D.C., 12-14 DEC 66.

1966, 685p PHS-Pub-1649

Descriptors: (*Air pollution, *Meetings).

Panel topics are: motor vehicles; heat and power generation; Industrial operations; solid waste disposal; state and interstate air pollution control programs; local or regional air pollution control programs; role of the federal government in air pollution control; and economic and social aspects of air pollution.

PB-216 904
Cornell Univ., Ithaca, N.Y. Dept. of Sanitary Engineering.
APPLICATION OF SECOND ORDER REACTION.
Final progress rept., 1 Sep 65-31 Aug 66,
Vaughn C. Behn. 1 Sep 66, 32p
Grant FWPCA-WP-00234-05

Descriptors: (*Trickling filtration, Reaction kinetics), (*Sewage treatment, Trickling filtration).

The report describes progress made in analyzing the activated sludge process and trickling filtration on the basis of a second order reaction. It lists abstracts of theses prepared in support of this work and includes a paper describing developments in the analysis of trickling filters.

PB-216 905
Washington Pollution Control Commission, Olympia.
A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL FOR THE CENTRAL COLUMBIA RIVER BASIN.
Water pollution series rept.
1954, 26P PHS-Pub-381, PHS-WPS-69

Descriptors: (*Columbia River Basin, *Water pollution).
Identifiers: *Water pollution abatement.

Contents: Hydrology; Water uses;Sources of pollution; Damage to water resources; Water quality objectives; Benefits and costs; Municipal requirements; Industrial requirements; Water quality objectives and minimum treatment requirements; and Minimum requirements for the prevention of industrial waste pollution.

PB-216 906
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
VIRUSES IN WASTE, RENOVATED, AND OTHER WATERS. LITERATURE ABSTRACTS.
Gerlad Berg, and F. Dianne White. 1969, 17p

Descriptors: (*Bibliographies, Viruses), (*Viruses, *Water pollution), Aquatic microbiology, Abstracts.

A bibliographies of 42 abstracts on viruses and aquatic microbiology is presented.

PB-216 907
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RESEARCH NEEDS IN WATER QUALITY CONSERVATION.
11 Sep 59, 15p
Presented at the Water for Texas Conference, College Station, Tex., 11 Sep 59.

Descriptors: (*Water pollution, Research management), Project planning.

The paper discusses major needs of water quality research. Topics considered are the origin of wastes, characterization of new wastes, means of waste treatment, waste disposal, water quality monitoring, and water treatment.

PB-216 908
Federal Water Pollution Control Administration, Cincinnati, Ohio.
REPORT ON POLLUTION IN THE LAKE TAHOE BASIN: CALIFORNIA - NEVADA, APPENDIX A. VOLUME 2.
A. W. West, and K. M. Mackenthun. Jul 66, 459p

Prepared in cooperation with Southwest Regional Office, San Francisco, Calif. Proceedings of Conference In the Matter of Pollution of the Interstate Waters of Lake Tahoe and Its Tributaries, held 18-20 Jul 66, at Stateline, Nev.

Descriptors: (*Lake Tahoe, *Water pollution), (*Nevada, Water pollution), (*California, Water pollution).
Identifiers: *Water quality data.

Lake Tahoe, astride the California-Nevada stateline in the Sierra Nevada Mountains, is one of the clearest, deepest freshwater lakes in the world. As the growth of resident and tourist populations alike increases at an accelerated rate, the problems associated with sewage and other waste disposal are magnified and the clarity and beauty of Lake Tahoe waters are threatened by algal nuisances that may arise from the nitrogen and phosphorus contained in these wastes. Likewise, silt from land clearing practices and real estate development is an increasing problem. The report discusses the nutrient and silt problems, the present status of sewage treatment and disposal, the water quality characteristics of lake waters, and the pollution abatement proposals designed to protect and preserve the quality and beauty of the interstate waters of Lake Tahoe. (Author Modified Abstract)

PB-216 909
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PARTICLE COUNTER AND SIZE ANALYZER.

1 Dec 59, 4p

Descriptors: (*Particle size distribution, *Defectors), (*Air pollution, Particles).
Identifiers: *Air pollution detection.

The report describes a particle counter and pulse-height analyzer designed to measure particle concentrations and size distributions of aerosols in the atmosphere and of solid particles or liquid droplets in gases.

PB-216 910
Communicable Disease Center, Atlanta, Ga.
MILK SANITATION ADMINISTRATION. SELECTED LECTURES FROM COURSE NO. 333, 16-20 FEBRUARY 1959.
Environmental health series,
Hugh E. Eagan. 1959, 206p PHS-Pub-728

Descriptors: (*Milk, *Food sanitation), Education.

The training program of the Communicable Disease Center provides a major means of disseminating the findings of research for the development of improved methods for the control of communicable diseases. It is desired that the publication of these selected lectures will contribute to continuing improvement in milk sanitation practices.

PB-216 911
Michigan Univ., Ann Arbor. Great Lakes Research Div.
STUDIES ON THE ENVIRONMENT AND EUTROPHICATION OF LAKE MICHIGAN.
Special rept. (Final),
John C. Ayers, and David C. Chandler. 1967, 422p
SR-30
Grant PHS-WP-00311

Descriptors: (*Lake Michigan, *Water pollution), (*Limnology, Lake Michigan), Biological surveys.
Identifiers: *Eutrophication.

The project is a multidisciplinary team approach to the biological, chemical, and sedimentary indications of the eutrophication process in the southern two-thirds of Lake Michigan. It also involved studies of weather- and air mass-modification by the lake and studies of the physical circulation of the lake as pertinent ancillary matters capable of influencing the expressions of eutrophication by lake parameters. Included also, as fundamental background, were studies of the bedrock framework of the lake basin and such additional facets of the geological history of the lake as were possible. (Author Modified Abstract)

PB-216 912
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PUBLIC HEALTH SIGNIFICANCE OF PARALYTIC SHELLFISH POISON A REVIEW OF LITERATURE AND UNPUBLISHED RESEARCH,
E. F. McFarren, M. L. Schafer, J. E. Campbell, K. H. Lewis, and E. T. Jensen. 1 Jul 56, 43p
Presented at the Annual Meeting of the National Shellfisheries Association and the Oyster Institute of North America, Miami Beach, Fla, p1-41, 30 Jul-2 Aug 56.

Descriptors: (*Shellfish, *Toxicology), Public health, Seafood, Ingestion (Biology), Food industry, Poisons, Fisheries.
Identifiers: *Poisonous fishes, Ciquatera, Tetrodotoxin.

The report reviews poison sources, occurrence and distribution, physiology and toxicology, characteristics, and prevention and control.

PB-216 913
Public Health Service, Washington, D.C. Div. of Engineering Services.
GRADE A DRY MILK PRODUCTS. RECOMMENDED SANITATION ORDINANCE AND CODE FOR DRY MILK PRODUCTS USED IN GRADE A PASTEURIZED MILK PRODUCTS.

1959, 51p
Supplement 1 to the Milk Ordinance and Code-1953 Recommendations of the Public Health Service.

Descriptors: (*Food processing, *Milk), (*Food sanitation, Milk), (*Dried foods, Milk), Pasteurizing, Standards, Dairy products.

These sanitation standards for the manufacture of dry milk products intended for use in the commercial preparation of Grade A pasteurized milk products have been developed as a supplement to the Milk Ordinance and Code--1953 Recommendations of the Public Health Service. Like the parent document, this supplement has the approval and endorsement of the U.S. Department of Agriculture and is recommended by the Public Health Service, U.S. Department of Health, Education, and Welfare, for voluntary adoption by States, counties, and municipalities. Modern milk drying techniques have made possible the manufacture of high quality dry milk products suitable for use in the commercial preparation of milk products such as reconstituted milk, reconstituted skim milk, cultured buttermilk, flavored reconstituted dairy drinks, special dietary products containing added milk solids, and cottage cheese. The National Conference on Interstate Milk Shipments requested the Public Health Service to cooperate with representatives of the Conference and the dry milk industry in drafting sanitary standards for the manufacture of Grade A dry milk products. The Service agreed to undertake the development of such standards.

PB-216 914
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
MUNICIPAL WATER FACILITIES. INVENTORY OF JANUARY 1, 1958, ARIZONA. A COOPERATIVE STATE-FEDERAL REPORT.
1958, 11p

Descriptors: (*Arizona, *Water supply), Inventories.

The volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. In a few States, places smaller than this size have been reported, and in one of two others the minimum size has been somewhat greater. The listing is alphabetic by name of place within the State. (Author)

PB-216 915
California State Dept. of Public Health, Berkeley. Bureau of Air Sanitation.
METEOROLOGICAL SUMMARIES OF IMPORTANCE TO AIR POLLUTION IN WESTERN SAN DIEGO COUNTY,
George C. Holzworth. 31 Dec 57, 95p

Descriptors: (*Air pollution, *California), (*Atmospheric motion, Air pollution), Meteorological data.
Identifiers: *San Diego County (California).

The purpose of the study was to provide summaries of existing information on characteristics of wind, atmospheric stability and cloudiness, and to describe the manner in which such variables may be expected to affect air pollution in San Diego County. From this information general conclusions were made as to the times and areas of relatively good or poor atmospheric dispersion. It is also intended that this report will be useful in understanding some of the meteorological factors in San Diego County's air pollution problem and will be of value in planning future studies.

PB-216 916
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
THE STUDY AND CONTROL OF STREAM POLLUTION IN THE UNITED STATES,
W. H. Frost. 1923, 9p

Descriptors: (*Water pollution, *United States).

The report is a pioneer (1923) analysis of water pollution problems in the United States. The author reviews corrective measures used at that time to enhance water quality and prophetically suggests the need for greater government control.

PB-216 917
Public Health Service, Washington, D. C.
A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL FOR THE LOWER PORTION UPPER MISSISSIPPI RIVER BASIN, DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES OF IOWA, MINNESOTA, AND WISCONSIN.
Water pollution series.
1955, 72P PHS-WPS-71, PHS-Pub-450

Descriptors: (*Mississippi River Basin, *Water pollution), (*Iowa, Water pollution), (*Illinois, Water pollution), (*Wisconsin, Water pollution).

The report sets forth the water pollution control program being followed by the respective States in the Lower Portion Upper Mississippi River Basin. The program, which is based on data available as of November 1, 1954, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and lakes, and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-216 918
Public Health Service, Cincinnati, Ohio. Ohio-Tennessee Drainage Basins Office.

OHIO RIVER DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.
1951, 196P PHS-Pub-136, PHS-WPS-12

Descriptors: (*Ohio River Basin, *Water pollution), (*United States, *Water resources).

The report presents information relative to the Ohio River basin and describes water resources usage, water pollution and resulting damage, and pollution prevention measures in effect and those required.

PB-216 919
Federal Water Pollution Control Administration, Cincinnati, Ohio.
BIOLOGY OF WATER POLLUTION. A COLLECTION OF SELECTED PAPERS ON STREAM POLLUTION, WASTE WATER, AND WATER TREATMENT,
Lowell E. Keup, William Marcus Ingram, and Kenneth M. Mackenthun. 1 Oct 67, 298p FWPCA-CWA-3

Descriptors: (*Water pollution, *Aquatic biology), (*Sewage treatment, *Microbiology), Fishes, Plankton, Ecology.
Identifiers: *Water pollution effects (Animals), *Water pollution effects (Plants).

The book of selected publications on Biology of Water Pollution, Water Treatment, and Sewage and Industrial Waste Treatment contains some of the many excellent and basic pertinent biological papers that have been commonly inaccessible to the contemporary investigator. The compiled collection will be of assistance in three phases of water pollution abatement: (1) It will provide a technical service to the aquatic ecologist through the assemblage of informative literature; (2) it wil illustrate many of the concepts upon which regulations have been formulated for the protection of aquatic life; (3) it will aid in the training of new environmental scientists. (Author Modified Abstract)

PB-216 920
Robert A Taft Sanitary Engineering Center, Cincinnati, Ohio.
WIND AND TURBULENCE INSTRUMENTATION FOR AIR POLLUTION STUDIES,
Robert A. McCormick. 1973, 21p
Presented at the National Meeting of the American Meteorological Society (175th), Chicago, Ill., 24-27 Mar 59.

Descriptors: (*Air pollution, *Meteorological instruments).

Discusses instrument requirements for three classes of air pollution studies: Climatological surveys, operational or synoptic activities, and research studies.

PB-216 921
Public Health Service, Washington, D.C. Div. of Radiological Health.
RADIONUCLIDE ANALYSIS BY GAMMA SPECTROSCOPY.
1973, 342p

Descriptors: (*Radioactive isotopes, *Gamma ray spectroscopy), (*Radiation measuring instruments, Gamma ray spectroscopy).

The report reviews the techniques used in gamma spectroscopy. Discussed are the instrument design, counting techniques, and chemical analysis.

PB-216 922
Hydroscience, Inc., Leonia, N.J.
MATHEMATICAL MODELS FOR WATER QUALITY FOR THE HUDSON-CHAMPLAIN AND METROPOLITAN COASTAL WATER POLLUTION CONTROL PROJECT.
Final rept.
Apr 68, 353p
Contract PH-86-65-125

Descriptors: (*Water pollution, *Mathematical models), (*Hudson River, *Water pollution), (*New York, Water pollution), (*New York Harbor, *Water pollution), (*Stream pollution, Mathematical models), (*New Jersey, Water pollution), Atlantic Ocean, Raritan River.

Water discharges from urban population centers, industries, rural runoff, and storm overflows carry significant quantities of nutrients, organic and inorganic pollution to our waterways. Programs to control water quality invariably require large capital and operating expenditures. Among the specific procedures which have been coasidered for pollution and water quality control are treatment plant construction, low flow augmentation, transportation of wastes and dispersion in oceans. It is the purpose of the report to present the mathematical models which will permit an assessment of water quality conditions and the improvements associated with various control procedures.

PB-216 923
Kansas State Dept. of Health, Topeka, Environmental Health Services.
WATER QUALITY AND TIME OF TRAVEL INVESTIGATIONS IN THE LOWER KANSAS RIVER BASIN,
J. Lee Mayes, Gerald A. Stoltenberg, and Howard A. Stoltenberg. Aug 67, 142p

Descriptors: (*Kansas River Basin, *Stream flow), (*Tracer studies, Kansas River Basin), Time lag, Tables (Data).
Identifiers: *Peak discharge.

Data was gathered to provide verification for predicted hydrologic and chemical quality variations incorporated into the mathematical model of the Lower Kansas River Basin developed by the University of Kansas. The data was also used to further define the characteristics of the basin for the purposes of the model. The time of travel information was collected as part of the basic data needed to determine reaeration constants for the portion of the basin involved, and for other basic considerations in the model.

PB-216 924
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
WATER POLLUTION PROBLEMS AND IMPROVEMENT NEEDS, LAKE ONTARIO AND ST. LAWRENCE RIVER BASINS.

Jun 68, 130p
Prepared in cooperation with New York State Dept. of Health, Albany.

Descriptors: (*Lake Ontario, *Water pollution), (*Saint Lawrence River, *Water pollution).

The report summarizes the water pollution problems of the United States waters of Lake Ontario and the St. Lawrence River and their tributaries. It identifies the causes of these problems or sources of pollution, discusses the improvements needed, and presents a program of recommended actions. The report is based on extensive field and office studies, initiated in 1964 and still continuing, by the Federal Water Pollution Control Administration's Rochester Program Office; and on information of the New York State Department of Health. (Author)

PB-216 925
Illinois Univ., Urbana. Dept. of Civil Engineering.
FATE OF SYNTHETIC DETERGENTS IN SOIL AND GROUND WATER.
Civil engineering studies, 1 Sep 59-31 Jan 65 (Final),
Shankha K. Banerji, and Ben B. Ewing. Nov 65, 117p Sanitary Engineering Ser-33
Grant PHS-WP-00018

Descriptors: (*Water pollution, *Surfactants), (*Detergents, Water pollution), Soil properties.
Identifiers: *Path of pollutants.

The objective of the study was to evaluate the relative importance of several factors on the retarded movement of ABS in a soil system receiving a waste containing detergent and to evaluate the fate of the phosphate builders in the soil system. The role of the biological slime which may develop in the top layer of soil and which may provide additional surface area for increased adsorption of ABS and phosphates was investigated. Also, in this zone, the slow percolation rates may allow enough time for biodegradation of both the ABS and phosphates. Deeper soil layers may retain the detergent components by adsorption. Environmental factors affecting this retention include the type of soil, concentration of solute, structure of solute, pH and temperature. (Author)

PB-216 926
Michigan Univ., Ann Arbor. Dept. of Civil Engineering.
CHEMICAL INTERACTIONS OF DISSOLVED SILICA WITH IRON (II) AND (III),
John E. Schenk, and Walter J. Weber, Jr. 1968, 13p
Grant FWPCA-WP-00674
Presented at Annual Conference, Atlantic City, N.J. 8 Jun 67. Pub. in Jnl. American Water Works Association, v60 n2 p199-212 Feb 68.

Descriptors: (*Water chemistry, *Silicon dioxide), (*Iron inorganic compounds, *Water chemistry), Oxidation, Hydrolysis.

Dissolved silica is a major constituent of most natural waters; yet its significance in water quality transformations has remained largely undefined. It is thus important to develop systematic information regarding the effects of silica on the chemical and biologic characteristics of natural waters. In defining the role of dissolved silica in water quality transformations, it is essential first to obtain sufficient information regarding the chemical nature of the various species of silica which may exist under different conditions in dilute aqueous solution. This article describes some of the results of an investigation of several of the reactions of dissolved silica in dilute solution. (Author Modified Abstract)

PB-216 927
Eastern Environmental Radiation Lab., Montgomery, Ala.
PUBLICATIONS OF THE EASTERN ENVIRONMENTAL RADIATION LABORATORY, MONTGOMERY, ALABAMA: 1961 - PRESENT.
1972, 11p

Descriptors: (*Radioactive contaminants, *Bibliographies), (*Radiobiology, *Bibliographies).

A bibliography is given on radiological monitoring, measurement, analysis, and effects.

PB-216 928
Eastern Environmental Radiation Lab., Montgomery, Ala.
PRESENTATIONS BY THE STAFF OF THE EASTERN ENVIRONMENTAL RADIATION LABORATORY, MONTGOMERY, ALABAMA: 1966-PRESENT.
1972, 6p

Descriptors: (*Radioactive contaminants, *Bibliographies), (*Radiobiology, *Bibliographies).

The bibliography lists publications on radiological contaminants, measurement, types of compounds, and effects.

PB-216 929
National Center for Urban and Industrial Health, Washington, D.C. Occupational Health Program.
INDUSTRIAL NOISE - A GUIDE TO ITS EVALUATION AND CONTROL,
Andrew D. Hosey, and Charles H. Powell. May 67, 121p PHS-Pub-1572

Descriptors: (*Noise (Sound), *Industrial medicine), Exposure, Audiometry.
Identifiers: *Noise exposure.

General principles used for evaluating occupational exposures to noise are no different from those used for an overall evaluation of the occupational environment. The purpose of the report is, to suggest guidelines to assist those industrial hygienists whose function may include the evaluation of occupational noise exposures. (Author Modified Abstract)

PB-216 930
University of Southern California, Los Angeles. Allan Hancock Foundation.
EDDY DIFFUSION AND BACTERIAL REDUCTION IN WASTE FIELDS IN THE OCEAN.
Final rept.,
James E. Foxworthy, and Hermann R. Kneeling. Sep 69, 187p 69-1
Grant FWPCA-WP-00931

Descriptors: (*Oceans, *Water pollution), (*Bacteria, Water pollution), (*Outfall sewers, *Turbulent diffusion), Plumes.

The material in the report is an extension of previous studies of turbulent eddy diffusion in the ocean. The present research was undertaken to extend the previously proposed models of turbulent diffusion from continuous point and large-scale sources by formulating a term to account for the rate of change of substances, such as indicator bacteria to gather additional information on the surface dispersion characteristics of waste material discharged from submarine outfalls equipped with and without diffuser systems, and to assess the effects of various environmental factors on the observed rates of disappearance of indicator bacteria.

PB-216 931
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT OF A STUDY SPONSORED BY THE FEDERAL HOUSING ADMINISTRATION TO DEVELOP PRACTICAL DESIGN CRITERIA FOR SEEPAGE PITS AS A METHOD FOR DISPOSAL OF SEPTIC TANK EFFLUENT,
Thomas W. Bendixen, Richard E. Thomas, and James B. Coulter. 1 May 63, 252p

Descriptors: (*Septic tanks, *Seepage), Design criteria.

The seepage pit is a common method of transmitting septic tank effluent into the soil. The most extensive application of the method has been in the western United States; however, pits have been used in significant numbers but on a spotty basis in many states throughout the nation. The study is devoted entirely to the problem of introducing septic tank effluent into the soil. The report determines under what conditions seepage pits are a satisfactory means of disposing of septic tank effluent at individual households, devises practical tests for judging the suitability of soils for seepage pits, and identifies design, construction, and administrative control practices desirable for good pit performance.

PB-216 932
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
PRESENT STATUS OF CHEMISTRY OF CHLORINE AND AMMONIA-CHLORINE TREATMENT OF WATER,
John F. Kachmar. May 42, 15p

Descriptors: (*Chlorine, *Water chemistry), (*Ammonia, Water chemistry), (*Sewage treatment, *Chlorination).
Identifiers: *Chloramines.

The report presents research results on studies concerning the reactions of trace amounts of chlorine and ammonia in water. Much of the discussion involves the chemistry of chloramine.

PB-216 933
Federal Water Pollution Control Administration, Cincinnati, Ohio. Analytical Quality Control Lab.
FWPCA METHOD FOR CHLORINATED HYDROCARBON PESTICIDES IN WATER AND WASTEWATER.
Clear water rept.

Apr 69, 35p

Descriptors: (*Water analysis, *Pesticides), (*Water pollution, Pesticides), (*Chlorine organic compounds, Water analysis), (*Gas chromatography, Pesticides).
Identifiers: *Water pollution detection.

The use of pesticides has become a routine practice in modern agriculture, but they represent a possible danger to the aquatic environment when present in even trace concentrations. Therefore, the monitoring of surface waters for pesticides is an essential part of the measurement of water quality. One laboratory has prepared a method for measuring chlorinated hydrocarbon pesticides which is discussed.

PB-216 934
Federal Water Pollution Control Administration, Metuchen, N.J. Northeast Region.
NATIONAL ESTUARINE POLLUTION STUDY PRELIMINARY REPORT, NORTHEAST REGION.

Jan 68, 94p

Descriptors: (*Northeast United States, *Water pollution), (*Estuaries, *Water pollution), New England.

The report summarizes certain readily available background information on estuarine conditions and prospects in the Northeast Region (which contains the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jesey and Delaware). With the exception of Vermont, all of the States in the Region have estuarine areas. Some information on Pennsylvania is also provided here because of Philadelphia's importance to the Delaware estuary, but the Middle Atlantic Region's report should be consulted for a complete discussion. (Author Modified Abstract)

PB-216 935
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ALGAL GROWTH AQUEOUS FACTORS OTHER THAN NITROGEN AND PHOSPHORUS. SELECTED BIOLOGICAL REFERENCES,
Kenneth M. Mackenthun, and William Marcus Ingram. 1966, 44p WP-24

Descriptors: (*Algae, *Bibliographies), (*Plant growth, Algae), (*Nutrients, Algae), Antibiotics, Hormones, Trace elements, Metals, Viruses, Vitamins.

Difficulties with water use associated with nutrient enriched waters have focused considered attention to those factors stimulating growths of algae. Algae are influenced by many and varied factors. Vitamins, trace metals, hormones and auxins, extracellular metabolites, autointoxicants, viruses, and predation and grazing by aquatic animals are factors that stimulate or reduce algal growths. It is the purpose of this bibliographic compilation to present some of the literature devoted to population influencing factors in the aquatic environment.

PB-216 936
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
THE ROLE OF THE BACTERIOLOGIST IN WAR AND DEFENSE,
C. T. Butterfield. 1940, 15p

Descriptors: (*Civil defense, *Scientists).

The most important duty of the bacteriologist, in war or in the preparation for national defense, is the preservation of health or the prevention of disease. The duties involved are those of the normal program augmented by certain conditions peculiar to the activities concerned.

PB-216 937
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RADIONUCLIDE ANALYSIS OF ENVIRONMENTAL SAMPLES. A LABORATORY MANUAL OF METHODOLOGY.
Technical rept.,
Paul F. Hallbach. 16 Nov 59, 122p SEC-TR-R59-6
Contract AT (49-5)-1288, AT (49-7)-1536

Descriptors: (*Radioactive isotopes, *Radiation measuring instruments).

The manual summarizes the analytical methods that have been developed by the staff of the Robert A. Taft Sanitary Engineering Center or modified from methods developed by others for use with environmental samples. The methods given provide procedures for identification of many radionuclides in a wide variety of environmental media. (Author Modified Abstract)

PB-216 938
Utah Univ., Salt Lake City. Inst. of Environmental Biological Research.
DEVELOPMENT OF TECHNIQUES FOR MULTI-PURPOSE MANAGEMENT OF REUSABLE WATER BEFORE IT ENTERS THE GREAT SALT LAKE.
Terminal rept. no. 4, 1 Sep 61-31 Aug 65,
Don M. Rees, Frank D. Arnold, Dean M. Andersen, and Glen C. Collett. Feb 66, 179p
Grant PHS-WP-00027
Report on Management of Reusable Water in Utah.

Descriptors: (*Great Salt Lake, *Water reclamation), (*Utah, *Water resources), Management planning, Public health, Irrigation, Fisheries.

Problems involving legal ownership and the multipurpose use of available water on the eastern shores of the Great Salt Lake have been in existence for more than a century. These problems are currently increasing proportionately with the recent rapid increase in the human population in this area and as a result are becoming more controversial and acute. In an attempt to assist in improving multipurpose use and management of the reusable water in this area, this cooperative research program was established. The objectives of the present study were to develop and field test physical facilities techniques and management practices for multipurpose use of reusable water on the eastern shores of the Great Salt Lake which will provide the greatest mutual benefits to public health, agriculture, fish and wildlife and other interests concerned.

PB-216 939
Columbia Univ., New York. Dept. of Industrial Engineering.
TABLES OF THE ASYMPTOTIC DISTRIBUTION OF THE THIRD EXTREME.
Technical rept.,
E. J. Gumbel, and C. K. Mustafi. 1 Apr 68, 13p
Grant NSF-GK-695

Descriptors: (*Radioactivity, *Statistical analysis), Random variables, Probability density functions, Tables (Data).

The paper discusses the use of statistical analysis in radioactive contamination.

PB-216 940
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
GROUND WATER POLLUTION IN THE SOUTH PLATTE RIVER VALLEY BETWEEN DENVER AND BRIGHTON, COLORADO.
Dec 65, 71p PR-4

Descriptors: (*Platte River, *Water pollution), (*Colorado, Water pollution), (*Ground water, Water pollution).
Identifiers: *Adams County (Colorado), *Water quality data.

The investigation of ground-water conditions in the South Platte River Valley between Denver and Brighton in southwest Adams County was undertaken as a part of the water pollution study of the Denver metropolitan area currently being conducted by the South Platte River Basin Project. Ground water is used extensively in the area for public, domestic, industrial and irrigation supplies. The principal source of large ground-water supplies is the shallow valley-fill deposits which are very susceptible to contamination. The rapidly expanding urban and industrial growth of the area has resulted in continued development of water supplies from ground-water sources. The purpose of the ground-water study was to determine sources and extent of pollution in the water-bearing formations in the area. In assessing these conditions the geology and water-bearing characteristics of the aquifers were considered. (Author)

PB-216 941
Arizona Agricultural Experiment Station, Tucson.
BOUNDARY FLOW IN LABORATROY PERMEAMETERS USED TO STIMULATE RECHARGE BY CYCLIC WATER SPREADING,
B. K. Worcester, T. H. McIntosh, and L. G. Wilson. 19 Jan 68, 5p Journal Paper-1269
Grant FWPCA-WP-00672
Revision of report dated 25 Sep 67. Pub. in Water Resources Research, v4 n3 p591-595 Jun 68.

Descriptors: (*Ground water recharge, *Hydraulic conductivity), Soil properties.

The contribution of boundary flow to the hydraulic conductivity values obtained from laboratory permeameters employed in cyclic flood-dry infiltration studies was evaluated. Hydraulic conductivity in the boundary zone was less than that of the inner matrix for a 2-mm sand. Conversely, the flow rate was greatest in the boundary zone for the finer textured sandy loam soils. The divergence between the hydraulic conductivity of the inner zone and the boundary zone was greatest during the first flooding period. For both matrix cycles, although of different magnitude, tended to be similar and parallel. A laboratory permeameter design is presented to facilitate partitioning the relative contributions of flow in the boundary and inner zones on the hydraulic conductivity values of soils. (Author)

PB-216 942
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
LAKE ERIE REPORT. A PLAN FOR WATER POLLUTION CONTROL.
Aug 68, 113p

Descriptors: (*Lake Erie, *Water pollution), (*Michigan, Water pollution), (*Ohio, Water pollution), (*New York, Water pollution), (*Pennsylvania, Water pollution), Cost analysis, Abatement.

The report recommends a plan of action, combining immediate and long-range needs. It describes the pollution problem and the ominous threat of continued pollution. It also describes what must be done to save Lake Erie, who will take these actions, and how much it will cost. It remains for the citizens of the basin to act quickly, decisively, and wholeheartedly. (Author Modified Abstract)

PB-216 944
Federal Water Quality Administration, Kansas City, Mo. Missouri Basin Region.
REVIEW AND EVALUATION OF THE WATER QUALITY PROGRAM IN MONTANA.
Sep 70, 63p
Prepared in cooperation with Northwest Regional Office, Portland Oreg.

Descriptors: (*Montana, *Water pollution).

The report presents an evaluation of the water quality control programs in the State of Montana and recommendations for improvement. The purpose of the study is to evaluate the authorities, organizational components, budget and manpower resources and functional programs devoted to water quality in Montana and to recommend improvements needed to meet the goals of water quality protection and enhancement in the State. (Author Modified Abstract)

PB-216 945
Federal Water Pollution Control Administration, Cincinnati, Ohio. Technical Advisory and Investigations Branch.
A REPORT ON POLLUTION OF THE UPPER COLORADO RIVER BASIN.
Apr 69, 82p PR-16
See also PB-216 218.

Descriptors: (*Colorado River Basin, *Water pollution), (*Arizona, Water pollution), (*Utah, Water pollution), (*Colorado, Water pollution), (*Wyoming, Water pollution), (*New Mexico, Water pollution), Tables (Data), Price River, Colorado River, Gunnison River, Uncompahgre River, San Juan River.
Identifiers: *Water quality data.

Water quality information is presented here for four geographical areas: The Upper Colorado River Main Stem; Price River System; Gunnison-Uncompahgre River Systems; and The San Juan River System. Water quality characteristics examined were dissolved oxygen, coliform bacteria, Salmonella bacteria, specific conductance, and metals. Water uses considered were public water supply, water contact recreation, fish and aquatic life, and agricultural and industrial water supply. All sampling was conducted within Colorado, New Mexico, and Utah.

PB-216 946
Rutgers - The State Univ., New Brunswick, N. J. Dept. of Environmental Science.
AEROBIC HETROTROPHIC BACTERIAL POPULATIONS OF SEWAGE AND ACTIVATED SLUDGE. II. METHOD OF CHARACTERIZATION OF ACTIVATED SLUDGE BACTERIA,
T. B. S. Prakasam, and Norman C. Dondero. 7 Apr 67, 7p
Grant FWPCA-WP-00645-01
Pub. in Applied Microbiology, v15 n5 p1122-1127 Sep 67.

Descriptors: (*Sludge, *Bacteria), Aerobic processes, Activated sludge process, Food chains, Nutrition, Metabolism, Microorganisms, Sludge digestion.
Identifiers: *Heterotrophy.

The replica-plating technique and Lochhead's nutritional method were combined in exploratory experiments to test their feasibility as useful means for characterizing the aerobic heterotrophic flora of activated sludge and to minimize the burdensome process of isolation, purification, and testing of isolates. In the test run, the method was about 86% reliable at the 0.05 level of significance. About 40% of the total number of bacteria able to grow on an aqueous extract of activated sludge did not grow on media containing glucose, amino acids, growth factors, and inorganic salts. The requirement for activated sludge extract suggested the existence of a requirement for unidentified nutrients contained in the activated sludge extract. (Author)

PB-216 947
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
A STUDY OF INDUSTRIAL WASTE POLLUTION IN THE SOUTH PLATTE RIVER BASIN. APPENDIX D. MEAT INDUSTRY WASTE STUDY. SUPPLEMENT TO BASIN REPORT.

Dec 66, 19p PR-6D

Descriptors: (*Platte River Basin, *Water pollution), (*Colorado, Water pollution), (*Food processing, Water pollution), Livestock, Inventories.
Identifiers: *Feedlot wastes, *Slaughtering house wastes, *Denver (Colorado), *Paunch.

A two and one-half year Industrial Waste Survey in the South Platte River Basin was culminated by the Federal Water Pollution Control Administration, South Platte River Basin Project in late 1966. The highlights of this Survey together with major recommendations on pollution abatement by industry are given in the basic report entitled 'A Study of Industrial Waste Pollution in the South Platte River Basin.' The Appendices represent a supplementary issue to the main report. Appendix D contains the results of a special study on the waste disposal problems of the meat industry within the Denver Metropolitan Area. (Author)

PB-216 948
National Field Investigations Center-Denver, Colo.
POLLUTION AFFECTING WATER QUALITY OF THE CHEYENNE RIVER SYSTEM WESTERN SOUTH DAKOTA.

Sep 71, 98p

Descriptors: (*Cheyenne River Basin, *Water pollution), (*South Dakota, Water pollution), Trace elements, Metals, Cyanides, Mercury.

A conference of state and federal agencies was called to consider the occurrence, distribution, and effects of cyanide, mercury, and other metals pollution in western South Dakota. The report presents the results of technical studies conducted in the Cheyenne River system to determine the location and extent of toxic materials due to previous mining activity, and measure the effect of the toxic substances on surface water, groundwater, and biota.

PB-216 949
National Field Investigations Center, Cincinnati, Ohio.
WATER QUALITY OF THE MISSOURI RIVER (GAVINS POINT DAM TO HERMANN, MISSOURI). OCTOBER-NOVEMBER, 1968 AND JANUARY-FEBRUARY, 1969, SURVEYS.
Richard K. Ballentine, James E. Arden, Loys P. Parrish, Delbert B. Hicks, and Stephen L. Bugbee. Jun 70, 118p

Descriptors: (*Missouri River, *Water pollution).

The purpose of the field surveys was to determine Missouri River water quality along the 700-mile reach from Gavins Point Dam near Yankton, South Dakota, to Hermann, Missouri (Figure 1) which includes parts of the borders of South Dakota, Nebraska, Iowa, Missouri, and Kansas. (Author Modified Abstract)

PB-216 950
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
STUDIES OF SEWAGE PURIFICATION. IX. TOTAL PURIFICATION, OXIDATION, ADSORPTION AND SYNTHESIS OF NUTRIENT SUBSTRATES BY ACTIVATED SLUDGE.
C. C. Ruchhoft, C. T. Butterfield, P. D. McNamee, and Elsie Wattie. 1965, 38p PHS-Pub-208

Descriptors: (*Activated sludge process, *Biochemical oxygen demand), (*Sewage treatment, Activated sludge process), Oxidation, Nutrients.

It is the purpose of the paper to present data on the total removal of biochemical oxygen demand (B.O.D.) of nutrient substrates by activated sludge and to show what portion of the total removal may be accounted for by oxidation. The demonstration of the portion of the total B.O.D. removal that is the result of oxidation has not been made before.

PB-216 951
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
SOUTH PLATTE RIVER BASIN IRRIGATION OF VEGETABLES WITH SEWAGE-POLLUTED WATER.
Nov 67, 76p PR-12

Descriptors: (*Irrigation, *Water quality), (*Public health, Irrigation), (*Platte River Basin, *Water pollution), (*Colorado, Water pollution), Vegetables.

The possible health hazard resulting from irrigation with sewage-polluted water of vegetables normally consumed raw has long concerned public health officials. Conflicting opinions have evolved on the degree of danger caused by this practice. Commonly accepted objectives for sewage irrigation practices have not been developed, nor have there been established generally approved standards for the quality of irrigation water. In the South Platte River Basin downstream from and north of Denver to Brighton, Colorado, the largest use of water is for agriculture. In the area immediately north of Denver many varieties of 'salad vegetables' were raised. At the time of this study these vegetables were irrigated with polluted water diverted via four main supply ditches from the South Platte River just below entry of the Denver Northside sewage treatment plant effluent. Other inadequately treated municipal and industrial effluents contributed to the overall pollution in this vicinity. During 1963-64 a field sampling and laboratory analysis program was conducted on vegetables, the soils in which they were grown, and the waters with which they were irrigated. Samples of vegetables, soils, and waters were analyzed for three bacterial indices of pollution.

PB-216 952
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY PAPILLION CREEK BASIN, NEBRASKA. STUDY OF THE NEEDS AND VALUE OF STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL.
Oct 66, 34p

Descriptors: (*Papillion Creek Basin, *Reservoirs), (*Nebraska, *Water resources).
Identifiers: *Washington County (Nebraska), *Douglas County (Nebraska), *Sarpy County (Nebraska).

The purpose of this study is to determine the need for and value of storage for municipal and industrial water supply and water supply and water quality control in the Papillion Creek Basin. Papillion Creek and its tributaries drain an area of 394 square miles in Washington, Douglas and Sarpy Counties, located in eastern Nebraska. The study covers a 100 year period, 1970 to 2070, as requested by the Corps of Engineers. (Author Modified Abstract)

PB-216 953
Public Health Service, Kansas City, Mo. Region VI.
WATER RESOURCES STUDY WHITE RIVER BASIN (PINE RIDGE UNIT) SOUTH DAKOTA.

May 63, 42p
Report on Study of Potential Needs and Value of Water for Municipal, Industrial, and Quality Control Purposes.

Descriptors: (*White River Basin, *Reservoirs), (*South Dakota, *Water resources), Slim Butte Reservoir.

The report is concerned with the need for and value of storage in the proposed Slim Butte Reservoir to satisfy the 50- and 100-year prospective needs for municipal and industrial water supply and water quality control in the White River Basin. Special consideration has been given to Dawes County, Nebraska, and Shannon County, South Dakota, since the largest demands for water from the proposed projects are expected to occur in these counties. (Author)

PB-216 954
Environmental Health Center, Cincinnati, Ohio.
THE EFFECT OF KRAFT PULP AND PAPER MILL WASTES OF PEARL RIVER.
Gerald N. McDermott. Oct 50, 87p
Prepared in cooperation with Louisiana Stream Control Commission, Baton Rouge.

Descriptors: (*Pearl River, *Water pollution), (*Paper industry, Water pollution), (*Louisiana, Water pollution).
Identifiers: *Water quality data.

The report covers a short-time study of Pearl River pollution above and below confluence of Bogue Lusa and limited observation of the tributary Bogue Lusa during late October and early November, 1950. Bogue Lusa receives wastes from a kraft pulp and paper mill and untreated domestic sewage from Bogalusa, Louisiana. (Author Modified Abstract)

PB-216 955
Public Health Service, Cincinnati, Ohio. Div. of Industrial Hygiene.
REPORT OF THE ACTIVITIES OF THE SUBCOMMITTEE ON THE DEVELOPMENT AND/OR STANDARDIZATION OF METHODS FOR THE STERILIZATION OF BEDDING, BEDDING MATERIALS AND UPHOLSTERED FURNITURE FOR 1951.

1951, 25p

Descriptors: (*Bedding equipment, *Sterilization), (*Furniture, Sterilization), Heating.

The Subcommittee on the development and/or standardization of methods for the sterilization of bedding, bedding materials and upholstered furniture has attempted to formulate a number of safe, effective, and economic methods for the sterilization of bedding materials and upholstered furniture requiring such treatment. The report reviews field surveys conducted by the subcommittee.

PB-216 956
Oklahoma State Univ., Stillwater.
KINETICS AND MECHANISM IN ACTIVATED SLUDGE PROCESSES.
Progress rept. 1 Sep 66-31 Aug 68,
A. F. Gaudy, Jr. May 68, 352p
Grant FWPCA-WP-00325

Descriptors: (*Activated sludge process, Reaction kinetics), (*Sewage treatment, Activated sludge process).

Following the detailed summary of work accomplished since the last report and a brief resume of project personnel, abstracts of papers and publications are presented. Finally, the original manuscripts of each paper are presented.

PB-216 957
Pacific Northwest Water Lab., Corvallis, Oreg.
PROCEEDINGS OF NATIONAL SYMPOSIUM ON FOOD PROCESSING WASTES (1ST), HELD IN PORTLAND, OREG. ON 6-8 APR 70.
Water pollution control research series.
1970, 408P FWQA-12060-04/70
Paper copy available from GPO $3.00 as I67.13/4:12060-04/70.

Descriptors: (*Food processing, *Industrial waste treatment), Meetings.
Identifiers: *Water pollution control.

The symposium was the first of a planned series of conferences to discuss current research on treatment of food processing wastes. The first two days of the conference were devoted to an in-depth review of current research and demonstration projects which have been funded largely by the Federal Water Quality Administration. The third day was concerned with discussions of research on improved in-plant and in-field processing intended to reduce the quantities of waste needing treatment, and replaced the Annual Western Regional Research Laboratory's Collaborators Conference.

PB-216 958
Public Health Service, Washington, D.C.
HISTORY OF THE UNITED STATES PUBLIC HEALTH SERVICE, 1798-1948,
Oscar R. Ewing, and Leonard A. Scheele. May 48, 12p
Identifiers: *Government agencies, *United States Public Health Service.

The paper presents a brief survey of the U.S. Public Health Service from the first marine hospital bill in 1798 to its present 1948 position.

PB-217 026
Oregon State Univ., Corvallis. Engineering Experiment Station.
WASTE WATER LAGOON CRITERIA FOR MARITIME CLIMATES.
Progress rept. no. 2, 1 Dec 59-1 May 62,
Fredrick J. Burgess, and Martin E. Northcraft. 1 May 62, 102p
Grant PHS-WP-185 (C2)
See also Pb-217 037.

Descriptors: (*Sewage treatment, *Lagoons (Ponds)).
Identifiers: *Aeration ponds.

The report describes progress made in studies conducted to establish criteria for the use of waste water oxidation lagoons in the maritime climates of the Pacific Northwest. The study determines basic factors influencing lagoon use under various conditions. These include surface reaeration mechanics, sludge accumulation and respiration, bacteriological quality, and disinfection requirements, together with other problems as defined in this report.

PB-217 027
California Univ., Berkeley. Inst. of Engineering Research.

ADVANCE STATEMENT OF PROGRESS ON NUTRITIONAL AND DISEASE TRANSMITTING POTENTIAL OF SEWAGE-GROWN ALGAE.
Summary rept. 1 May 63-1Mar 64.

22 Apr 64, 14p
Grant PHS-WP-00026-R3

Descriptors: (*Algae, *Sewage treatment), (*Feeding stuffs, Algae), Nutrients, Harvesting.
Identifiers: *Nutrient removal.

The report briefly summarizes progress on a study of nutritional and disease transmitting potential of sewage-grown algae. It includes pond performance, harvesting and coliform survival, animal feeding experiments with algae, nutritive characteristics, and DDT and other pesticide content.

PB-217 028
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
A REPORT OF BACTERIOLOGICAL STUDIES OF SEWAGE TREATMENT PROCESSES CARRIED ON AT THE WARDS ISLAND, NEW YORK, SEWAGE TREATMENT PLANT, MADE IN COOPERATION WITH THE CITY OF NEW YORK,
C. T. Butterfield. 1943, 18p

Descriptors: (*Sewage treatment, *Activated sludge process).
Identifiers: Wards Island Sewage Treatment Plant.

The report presents results obtained from a brief bacteriological study of the treatment of sewage by the activated sludge process and by the Guggenheim process of sewage purification.

PB-217 029
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
A MEMORANDUM ON THE ACTIVATED SLUDGE PROCESS AT WARDS ISLAND, NEW YORK, SEWAGE TREATMENT PLANT, AND THE GUGGENHEIM PROCESS THERE AND AT ANDERSON, INDIANA,
James B. Lackey. 11 Mar 43, 8p

Descriptors: (*Sewage treatment, *Activated sludge process).
Identifiers: Wards Island Sewage Treatment Plant, Anderson Sewage Treatment Plant.

The report presents results of a bacteriological study made of the Wards Island sewage treatment plant and makes comparisons with a similar survey at Anderson, Indiana.

PB-217 030
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
ON THE BIOLOGICAL ASPECTS OF PAPER MILL POLLUTION IN CERTAIN PARTS OF THE COLUMBIA RIVER WATERSHED, WITH ESPECIAL REFERENCE TO 'SPHAEROTILUS NATANS',
James B. Lackey. 1941, 16p

Descriptors: (*Sphaerotilus, *Aquatic microbiology), (*Water pollution, Aquatic microbiology), (*Columbia River, Sphaerotilus), (*Paper industry, Water pollution), Bacteria.
Identifiers: *Water pollution effects (Plants).

The report details background and results of field investigations conducted by the author on the Columbia River near Portland, Oregon. The purpose of the investigation was to ascertain the identity and causes of growth of slimy masses fouling the river.

PB-217 031
Public Health Service, Cincinnati, Ohio. Water and Sanitation Investigations.
SIGNIFICANCE OF THE COLIFORM GROUP OF BACTERIA AND OF OTHER BACTERIA AS A CRITERION OF THE SANITARY QUALITY OF WATER.
Memoranudm rept.,
C. T. Butterfield. 1 Feb 45, 12p

Descriptors: (*Coliform bacteria, *Water pollution), (*Aquatic microbiology, Water pollution), Indicator species, Water quality, Escherichia coli, Infections, Enlerobacteriaceal, Standards, Criteria, Public health.

The qualifications of the coliform group to serve as criteria of water pollution may be summarized as follows: (1) Bacteria of the coliform group are invarible found in large numbers in the feces of man and certain animals. (2) Analysis of the records for water quality as based on the coliform group, and for intestinal diseases in communities with public water supplies indicates that the coliform group has served effectively as an indicator of fecal pollution. (3) All component members of the coliform group of bacteria tend to die out in waters at approximately the same rates regardless of whether the exposure is to natural or artificial purification processes. (4) A method (primary planting in lactose broth with confirmation in Brilliant Greer Lactose Bile broth) is available for the determination of the coliform group.

PB-217 032
Federal Water Pollution Control Administration, Denver, Colo. Region VIII.
WATER QUALITY CONTROL STUDY OF THE YELLOW JACKET PROJECT, WHITE AND YAMPA RIVER BASINS, COLORADO.
Jan 66, 35p

Descriptors: (*White River Basin, *Reservoirs), (*Yampa River Basin, *Reservoirs), (*Colorado, *Water resources).

A survey has been made of the Yellow Jacket Project which discloses that there is no apparent need for storage for streamflow regulation for the purpose of water quality control. The conclusion is based on results of economic and demographic studies which indicate that future waste loadings will not impair water quality for present and projected water users in the area. (Author)

PB-217 033
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
LAKE ERIE ENVIRONMENTAL SUMMARY, 1963-1964.
May 68, 177p

Descriptors: (*Lake Erie, *Water pollution), Sediments, Water chemistry, Aquatic biology.

The Federal Water Pollution Control Administration and its antecedent, the Division of Water Supply and Pollution Control of the U. S. Public Health Service, have gathered a great amount of data on the physical, chemical, and biological characteristics of Lake Erie. Various reports by those agencies and others have been based on the gathered data. This report is an attempt to summarize the information gathered in the years 1963 through 1965. The purposes are (1) to provide a document for validating previous reports on the pollution problems in Lake Erie and (2) to provide a base for comparison with future lake surveillance data. (Author Modified Abstract)

PB-217 034
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
A COOPERATIVE BACTERIOLOGICAL STUDY OF WATERS FROM LAKE MICHIGAN IN THE VICINITY OF DUNNE CRIB AND OF TREATED WATERS OF THE SOUTH CHICAGO WATER SUPPLY,
C. T. Butterfield, and Elsie Wattie. 1942, 89p

Descriptors: (*Lake Michigan, *Biological surveys), (*Bacteria, *Water analysis), Standards.
Identifiers: Water pollution detection.

The report describes the results of a validation study whereby the procedures employed by independent laboratories for water pollution analysis were compared.

PB-217 036
Consumer Protection and Environmental Health Service, Washington, D.C.
DEVELOPMENT OF CONSTRUCTION AND USE CRITERIA FOR SANITARY LANDFILLS.
Interim rept.

1969, 258P
Grant PHS-UI-00046

Descriptors: (*Waste disposal, *Earth fills), Methane, Water pollution, Gas flow, Diffusion.
Identifiers: *Sanitary landfills, *Solid waste disposal.

The County of Los Angeles is conducting a three-year program of research and investigation for the development of construction and use criteria for sanitary landfills. The report describes the first year program which included: A study of the existing state-of-the-art in construction and operation; An evaluation of gas movement in certain existing sites; Review of literature regarding possible effects of sanitary landfills and ground water quality; Laboratory experiments for testing flow rate of gas through various soils; Development of solutions for controlling gas generated in sanitary landfills; and Field operations of gas sampling and analysis and settlement surveying.

PB-217 037
Oregon State Univ., Corvallis. Engineering Experiment Station.
WASTE WATER LAGOON CRITERIA FOR MARITIME CLIMATES.
Final rept.,
Frederick J. Burgess, and Martin E. Northcraft. 1 Jul 65, 151p
Grant PHS-WP-185
See also PB-217 026.

Descriptors: (*Sewage treatment, *Lagoons (Ponds)), Pacific Northwest.
Identifiers: *Aeration ponds.

The report describes a waste water oxidation lagoon study conducted at Oregon State University. The study was instigated in an effort to better understand biological, chemical and physical mechanisms involved in the stabilization of organic wastes in oxidation lagoons operating in maritime climates. It establishes criteria for design and operation of aerobic lagoons in the maritime climate of the Pacific Northwest.

PB-217 038
Lake Tahoe Area Council, South Lake Tahoe, Calif.
EUTROPHICATION OF SURFACE WATERS - LAKE TAHOE: LABORATORY AND PILOT POND STUDIES.
Progress rept. no. 2.

May 69, 196p

Descriptors: (*Lake Tahoe, *Limnology), Nutrients, Algae, Sewage.
Identifiers: *Eutrophication.

The report determines by the most effective laboratory bioassay techniques available whether there is present in effluents from waste water treatment processes, or in surface wash or groundwater seepage from inhabited or uninhabited areas, materials capable of stimulating algal growth in surface waters; and at what concentrations they may be significant. It also demonstrates

by studies on artificial ponds the applicability to Lake Tahoe of the results of laboratory assays of possible inputs to the lake.

PB-217 039
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
BACTERIAL RESPONSE TO CHLORINATED PROTEINS.
Final rept. 1 Sep 65-31 Aug 66,
Robert S. Ingols. 1966, 12p GIT-B-276
Contract PHS-WP-00188-06

Descriptors: (*Sewage treatment, *Chlorination), (*Bacteria, Chlorination).

Chlorination of water supplies has provided excellent protection against pathogenic bacteria. A part of the chlorine, however, which is added can substitute on the organic matter, and such chlorine substitution is the principal concern of this report because of its possible immediate toxic reaction and of its long term ecological damage in a river system.

PB-217 040
Washington State Dept. of Health, Olympia.
EVALUATION OF AIR POLLUTION IN THE STATE OF WASHINGTON.
Cooperative survey rept. 1 Jul-30 Nov 56,
E. R. Hendrickson, D. M. Keagy, and R. L. Stockman. Dec 56, 170p
Prepared in cooperation with Department of Health, Education, and Welfare.

Descriptors: (*Air pollution, *Washington (State)).

The objective of the study was to investigate the status of air pollution in Washington and to supply, insofar as possible, data from which the need and scope of future air pollution program activity on a state or local basis could be determined. The scope of the study was to assess the present and potential state problem and to delineate specific problem areas, present and future, through a study of population distribution and trends, geography and topography, meteorology and climatology, and existing and potential sources of pollution. In addition, a determination was made of available resources in the State for research and investigation in air pollution problems. (Author Modified Abstract)

PB-217 041
Humbolt State Coll., Arcata Calif.
CHLOROPHYLL CONCENTRATION AND OXYGEN PRODUCTION IN A SEWAGE OXIDATION POND. PART III. IMPROVEMENT OF OXIDATION POND EFFLUENTS BY ORGANISMS.
Final rept.,
Charles E. Hazel, and John W. DeWitt. 1 Jan 64, 83p
PHS-WP-00020-04

Descriptors: (*Lagoons (Ponds), *Phytoplankton), (*Sewage treatment, Lagoons (Ponds)), Chlorophylls, Oxygen.
Identifiers: *Aeration ponds.

The main objectives of the study reported were to gain fundamental knowledge of the dynamics of the populations of phytoplankton and of some of the principal environmental influences on the dynamics of these populations, and to determine primary production in a sewage oxidation pond. Preliminary measurements were made of short-term changes in phytoplankton concentrations at various depths in the pond and at different times of day. These short-term changes where then considered in designing a comprehensive phytoplankton sampling program to meet the overall objectives of the project. Along with samples collected to estimate the size of the populations of phytoplankton, simultaneous measurements were frequently made of solar radiation, the standing crop of Daphnia magna, ash-free dry weight of suspended matter, gross oxygen production, and community respiration. (Author)

PB-217 042
Minnesota Dept. of Health, Minneapolis.
AN APPRAISAL OF AIR POLLUTION IN MINNESOTA.
Rept. for Oct 59-Jul 60,
George J. Raschka. Jan 61, 78p
Prepared in cooperation with Department of Health, Education, and Welfare, Washington, D.C.

Descriptors: (*Minnesota, *Air pollution).
Identifiers: *Air quality data.

The report owes its preparation to the growing interest and concern about air pollution expressed by the people of Minnesota. It gathers together and interprets as far as possible information presently available and pertinent. The report is presented in eight technical sections, each of which discusses some single aspect of the air pollution problem.

PB-217 043
Environmental Health Center, Cincinnati, Ohio.
ACTIVATED SLUDGE FROM COMMON FOODS FOR RADIOACTIVE WASTE TREATMENT (LABORATORY STUDIES),
C. C. Ruchhoft, Francis I. Norris, and Lloyd R. Setter. 8 Sep 50, 35p
Presented at National Meeting of the American Chemical Society, (118th), Chicago, Ill., 3-8 Sep 50.

Descriptors: (*Activated sludge process, *Nutrients).

The common purpose of the activated sludge process is to remove organic material from suspension and solution. As applied to the treatment of radioactive waste the purpose is to remove inorganic isotopes from very dilute waste water solutions. Laboratory studies in nine-liter bottles on the development and control of activated sludge fed with common foods were made. One of the objectives of these studies was the control of a biological process having adsorptive properties which may be used for removing radioactive wastes from liquors normally deficient or devoid of organic food for zoogleal organisms.

PB-217 044
Environmental Health Center, Cincinnati, Ohio.
SURVEY OF LITERATURE RELATING TO INFANT METHEMOGLOBINEMIA DUE TO NITRATE CONTAMINATED WATER,
Graham, Walton. Feb 51, 21p

Descriptors: (*Reviews, Methemoglobinemia), (*Public health, Water pollution), (*Methemoglobinemia, Water pollution), (*Water pollution, *Inorganic nitrites), Blood diseases, Toxic diseases, Potable water, Water supply, Infants, Inorganic nitrates.
Identifiers: *Water pollution effects (Humans).

Methemoglobinemia is due to the presence of methemoglobin in the blood. It may result from the reaction of any one of several oxidizing agents with the hemoglobin normally present in the blood. Unlike the oxygen in hemoglobin, that in methemoglobin is so firmly bound that the methemoglobin cannot function as an oxygen carrier by alternate oxygenation and deoxygenation. Thus, the result may be anoxemia with serious consequence or even death. Although methemoglobinemia may result from congenital heart diseases, or from the ingestion, inhalation, or absorption, also from the medicinal administration, of any one of several drugs or chemicals, an important cause of cases in infants is the ingestion of water high in nitrate. This review of the literature is concerned with the latter cause.

PB-217 045
Environmental Health Center, Cincinnati, Ohio.
A COMPARATIVE STUDY OF OXYGEN CONSUMED METHODS,
W. Allan Moore, F. J. Ludzack, and C. C. Ruchhoft. 5 Sep 50, 22p
Presented at the National Meeting of the American Chemical Society, Chicago, Ill., 3-8 Sep 50.

Descriptors: (*Water analysis, *Oxygen).
Identifiers: *Oxygen demand.

During the past few years several methods have been proposed for the determination of oxygen consumed values of organic wastes. There is a definite need for a better oxygen consumed method for stream sanitation and industrial waste studies. In order to evaluate the various proposed methods a comparative study was made. Four organic compounds which are typical of those to be found in sewage and industrial wastes were used. In addition, a study of four industrial wastes was made.

PB-217 046
Lynchburg, Va.
A PILOT STUDY OF AIR POLLUTION IN LYNCHBURG, VIRGINIA, FEBRUARY 9-15, 1961.

15 Feb 61, 26p
Prepared in cooperation with Public Health Service, Lynchburg, Va.

Descriptors: (*Virginia, *Air pollution)..
Identifiers: *Air quality data, *Lynchburg (Virginia).

Lynchburg is located in the deep, narrow James River Valley at the foothills of the Blue Ridge Mountains in Central Virginia. Since 1945, there have been complaints about smoke, odors, and smog in Lynchburg, Virginia. This was climaxed by an incident of paint blackening on a group of houses in 1958. Following the appraisal of the problem it seemed advisable to carry out a pilot study to obtain initial data on the general air pollution levels in Lynchburg. The study was planned to provide intensive air pollution sampling for seven days, February 9-15, including one weekend and one all-night sampling period.

PB-217 047
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
THE BEET SUGAR INDUSTRY--THE WATER POLLUTION PROBLEM AND STATUS OF WASTE ABATEMENT AND TREATMENT.

Jun 67, 195p PR-8

Descriptors: (*Platte River Basin, *Water pollution), (*Food processing, Water pollution), (*Industrial waste treatment, Food processing), Industrial wastes.
Identifiers: *Sugar beet processing, *Water pollution control.

Primary attention is focused upon the beet sugar industry in the South Platte River Basin. Beet sugar wastes are the largest source of pollution within the area. Ten sugar factories are dispersed throughout the region and affect water quality over 300 miles of Basin streams. This report comprises five major parts. Section 1 consists of introduction and background to the problem, and description of process operations. Section 2 gives the results of industrial surveys and status evaluation on each of the ten factories in the Basin. Section 3 discusses total factory waste loads before and after treatment. Section 4 describes the bacteriological aspects of sugar beet waste pollution across the country. Section 5 offers a comprehensive review and evaluation of waste abatement and treatment throughout the industry both in the U.S. and abroad. (Author)

PB-217 048
Public Health Service, Cincinnati, Ohio. Water and Sanitation Investigations.
THE USE OF MICROSCOPIC ORGANISMS AS ECOLOGICAL INDICATORS AND METHODS OF SAMPLING AND MANIPULATION.
Memorandum rept.,
James B. Lackey. 21 Feb 45, 7p

Descriptors: (*Indicator species, *Water pollution), (*Aquatic microbiology, *Water quality), Ecology, Sampling.

The microscopic flora and fauna exclusive of bacteria, of natural waters, prepared waters from water purification plants, and raw and treated sewage, offer a variety of information relative to those waters. The organisms frequently indicate the hardness or softness of the waters involved; the nature of the acidity, if acid; the region from which the water is derived; the degree of fertilization of the water; the source of tastes and odors; the degree of effectiveness of purification and filtration; the condition of a sewage treatment plant; and sometimes what specific trade wastes are present. Pollution can be classified. The report briefly reviews the use of such indicator species.

PB-217 049
International Joint Commission-United States and Canada.
POLLUTION OF INTERNATIONAL BOUNDARY WATERS 1948-1949 INVESTIGATION. NIAGARA RIVER, LAKE ERIE - LAKE ONTARIO SECTION.
May 50, 254p

Descriptors: (*Niagara River, *Water pollution), (*Lake Ontario, *Water pollution), (*Lake Erie, *Water pollution).
Identifiers: *Water quality data.

This investigation of pollution of the boundary waters in the Lake Erie-Lake Ontario Section extended from July 1948 to November 1949. A comprehensive examination has been made of all types of pollution. Additional information has been secured from a number of sources. (Author Modified Abstract)

PB-217 050
International Joint Commission-United States and Canada.
REPORT OF THE BOARD OF TECHNICAL ADVISERS TO THE INTERNATIONAL JOINT COMMISSION ON THE POLLUTION OF INTERNATIONAL BOUNDARY WATERS, 1946--1948 INVESTIGATION. LAKE HURON-LAKE ERIE SECTION AND LAKE SUPERIOR-LAKE HURON SECTION.

Aug 49, 354p

Descriptors: (*Lake Huron, *Water pollution), (*Lake Erie, *Water pollution), (*Lake Superior, *Water pollution), Canada, United States.
Identifiers: *Water quality data.

The report describes an investigation of pollution in the boundary waters of the Lake Huron-Lake Erie section from July, 1946, to December, 1948, and the Lake Superior-Lake Huron section from July, 1947, to July 1948. A comprehensive examination is made of all phases of pollution and recommendations are made for its control.

PB-217 051
Consumer Protection and Environmental Health Service, Washington, D.C.
THE TEZUKA REFUSE COMPRESSION SYSTEM.
Preliminary rept.

1969, 54P
Grant PHS-UI-00073

Descriptors: (*Waste disposal, *Compacting), (*Bailing, *Waste disposal).
Identifiers: *Solid waste disposal.

The research objectives were to determine the feasibility of new method of solid waste disposal by making a comprehensive evaluation of the costs and benefits obtainable for the collection, transportation and disposal of solid wastes from urban areas by the use of rail-haul techniques. The report describes the Tezuka Refuse Compression System. It consists basically of three major system building blocks: The preliminary compression system; The main compression system; and Equipment to add additional cover material such as asphalt or cement to the bales previously compressed within an enclosure such as chicken wire mesh.

PB-217 052
National Center for Urban and Industrial Health, Cincinnati, Ohio.
REFUSE COLLECTION AND DISPOSAL: A ANNOTED BIBLIOGRAPHY 1956-1957.
Bibliography series,
Edward R. Williams. 1967, 55p PHS-Pub-91-Suppl-C, PHS-BS-4Suppl-C

Descriptors: (*Waste disposal, *Bibliographies), (*Refuse disposal, Bibliographies).
Identifiers: *Solid waste disposal.

The supplement to the Public Health bibliography series, covers the period 1956-1957, and is arranged in sections which correspond to the various administrative and operational phases of the broad field of refuse collection and disposal. The references have been annotated for increased usability as an aid in the exchange of information in both the research and operational phases of refuse sanitation activities. (Author Modified Abstract)

PB-217 053
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. VOLUME 3 - REGION III - DISTRICT OF COLUMBIA, KENTUCKY, MARYLAND, NORTH CAROLINA, VIRGINIA, WEST VIRGINIA, PUERTO RICO, VIRGIN ISLANDS,
G. E. McCallum. 1960, 117p PHS-Pub-775-Vol-3

Descriptors: (*Water supply, *District of Columbia), (*Kentucky, *Water supply), (*Water supply, *Maryland), (*Water supply, *North Carolina), (*Water supply, *Virginia), (*Water supply, *West Virginia), (*Puerto Rico, *Water supply), (*Water supply, *Virgin Islands), Inventories.

The document brings together in one publication pertinent facts about individual water works installations. It covers the District of Columbia, Kentucky, Maryland, North Carolina, Virginia, West Virginia, Puerto Rico, and the Virgin Islands.

PB-217 054
Public Health Service, Cincinnati, Ohio. Water and Sanitation Investigations.
OHIO RIVER POLLUTION CONTROL,
M. LeBosquet, Jr. 1944, 21p
Speech delivered before the Delegates of the Ohio River Valley Water Sanitation Compact, Pittsburgh, Pa., 7 Dec 44.

Descriptors: (*Ohio River Basin, *Water pollution), Environmental surveys.

An Ohio River committee was appointed to locate all important sources of pollution, ascertain the amount of polluting material discharged at each, measure the present effects of the wastes on the streams by means of physical, chemical, bacteriological and biological examinations, and determine present and prospective uses of streams.

PB-217 055
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
EFFECTS OF POLLUTION ON THE AQUATIC LIFE RESOURCES OF THE SOUTH PLATTE RIVER BASIN.
Rept. for Jul 63-Jan 67.
Dec 67, 170p PR-11
See also Volume 2, PB-217 056.

Descriptors: (*Platte River Basin, *Biological surveys), (*Water pollution, *Platte River Basin), colorado, Nebraska, Sources, Sewage, Industrial wastes.

The report contains the results of biological studies undertaken in the South Platte River Basin during the period of July 1963 through January 1967. (Author Modified Abstract)

PB-217 057
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
A DETAILED STUDY OF THE OXIDATION DITCH AS A METHOD OF WASTEWATER TREATMENT AT CAMERON, WEST VIRGINIA.
Final rept.,
Jerry C. Burchinal. Nov 67, 55p
Grant FWPCA-WP-36-01-02

Descriptors: (*Sewage treatment, *Lagoons (Ponds)), Channels (Waterways), Cost estimates, Water flow.
Identifiers: *Aeration ponds.

The final report on the Oxidation Ditch Study at Cameron, West Virginia contains the following information: Chemical and bacteriological studies, Velocity studies, Capital cost studies, Operating cost studies, Stream studies, Oxygen uptake studies, Microbiological studies, The role of the oligochaete worms in the oxida[illegible]ch method of sewage treatment.

PB-217 058
Utah Univ., Salt Lake City. Inst. of Environmental Biological Research.
DEVELOPMENT OF TECHNIQUES FOR MULTI-PURPOSE MANAGEMENT OF REUSABLE WATER BEFORE IT ENTERS THE GREAT SALT LAK[illegible].
Annual rept. no. 3, 1 Dec 63-30 Nov 64,
Don M. Rees, Frank D. Arnold, Dean M. Anderson, and Glen C. Collett. Mar 65, 145p
Grant FWPCA-WP-00027-03

Descriptors: (*Reservoirs, *Utah), (*Great Salt Lake, *Water resources), Management.

An investigation ha[illegible] been in operation to determine the effect of the use of water which eventually flows into the Great Salt Lake upon mosquito production, waterfowl propagation and management, agriculture, recreation, and other programs which are connected with the use of this water. The project is expected to provide demonstration areas that will show how certain kinds of water management practices can: minimize the production of pest and disease-bearing mosquitoes, increase crop yields, provide improved conditions for wildlife production and management, and improve beneficial uses of the land and water in the area.

PB-217 059
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
MUNICIPAL WASTE REPORT, METROPOLITAN DENVER AREA, SOUTH PLATTE RIVER BASIN.
Dec 65, 56p PR-3
Errata sheet inserted.

Descriptors: (*Platte River Basin, *Water pollution), (*Colorado, Water pollution).
Identifiers: *Denver (Colorado).

The long-range goals and objectives of the Project are: Determine the legitimate water uses and locate the sources of pollution having an adverse effect on those uses; Through field investigations determine the physical, chemical, and biological responses of the River to pollution and evaluate the previously located sources of pollution with respect to the conditions in the River; Compute the waste load reductions necessary to obtain desired water quality and recommend water quality control measures needed to effect the desired waste load reductions.

PB-217 060
Lake Tahoe Area Council, South Lake Tahoe, Calif.
EUTROPHICATION OF SURFACE WATERS - LAKE TAHOE: INDIAN CREEK RESERVOIR.
Progress rept. no. 1.

May 70, 147p

Descriptors: (*Lake Tahoe, *Limnology), Nutrients, Indian Creek Reservoirs, Sewage, Waste disposal.
Identifiers: *Eutrophication, Sewage treatment effluent, Liquid waste disposal.

The report covers the geographical, geological, and hydrological character of the Indian Creek Reservoir area; the general limnological aspects of the reservoir; and the nature and findings of physical, chemical, and biological analyses of the reservoir water. The study relates these characteristics of the reservoir water to the nutrient concentrations and biostimulatory characteristics of the influent waste water, and evaluates the relative contribution of biostimulants in the treated effluent and in the underlying soil and sediment exchange.

PB-217 061
National Center for Urban and Industrial Health, Cincinnati, Ohio.
REFUSE COLLECTION AND DISPOSAL, AN ANNOTATED BIBLIOGRAPHY, 1958-1959.
Bibliography series,
Edward R. Williams, and Ralph J. Black. 1961, 80p
PHS-Pub-91-Suppl-D, PHS-BS-4-Suppl-D

Descriptors: (*Waste disposal, *Bibliographies), (*Refuse disposal, Bibliographies).
Identifiers: *Solid waste disposal.

The bibliography covers the period 1958-1959, and is arranged in sections which correspond to the various administrative and operational phases of the broad field of refuse collection and disposal.

PB-217 062
Consumer Protection and Environmental Health Service, Washington, D.C.
EVALUATION OF THE MELT-ZIT HIGH-TEMPERATURE INCINERATOR. OPERATION TEST REPORT, AUGUST, 1968.

1969, 115p
Grant PHS-UI-00076
Includes addendum.

Descriptors: (*Waste disposal, *Incinerators).
Identifiers: *Solid waste disposal.

Incineration is the basic method for the reduction of municipal refuse to a minimum volume for disposal in landfilling. The Melt-Zit principle is unique in the incinerator art. The non-combustible fractions of the refuse are melted in a bed of high-temperature coke, and drained from the furnace as molten slag and iron. Organic matter in the residue is thereby automatically prevented and complete sterility is achieved. The residue has a high density. The report describes the testing and economics of this system.

PB-217 063
Lake Tahoe Area Council, South Lake Tahoe, Calif.
EUTROPHICATION OF SURFACE WATERS - LAKE TAHOE: PILOT POND AND FIELD STUDIES.
Progress rept. no. 3.

May 70, 119p

Descriptors: (*Lake Tahoe, *Limnology), Algae, Nutrients, Sewage.
Identifiers: *Eutrophication.

The report demonstrates the applicability to Lake Tahoe of the results of laboratory assays or possible inputs to the lake; evaluates the danger to Lake Tahoe of man's waste effluents and land practices in the basin, on the basis of results of studies in pilot-scale experimental ponds and a survey of the various nutrient sources within the basin; and compares the growth stimulating characteristics of tertiary effluent in Lake Tahoe water with that of the same effluent when ponded in Indian Creek Reservoir.

PB-217 064
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY AND WATER QUALITY CONTROL REQUIREMENTS, SHIDLER RESERVOIR, SALT CREEK, OKLAHOMA.

Sep 62, 18p
Prepared in cooperation with Army Engineer District, Tulsa, Okla.

Descriptors: (*Arkansas River Basin, *Reservoirs), (*Oklahoma, Reservoirs), Shidler Reservoir.
Identifiers: *Osage County (Oklahoma).

Shidler Reservoir will be on Salt Creek, a tributary to the Arkansas River, in Osage County, Oklahoma. It will have 29,500 acre-feet of flood control and 11,000 acre-feet of conservation storage. The conservation pool will yield 4.5 million gallons per day. No significant adverse effects are expected.

PB-217 065
Public Health Service, San Francisco, Calif. Region IX.
WATER QUALITY CONTROL STUDY. AMERICAN RIVER - TAHOE BASIN DIVERSIONS CALIFORNIA. A PRELIMINARY EVALUATION OF EFFECTS ON WATER QUALITY AND WATER USE.

May 64, 17p

Descriptors: (*Lake Tahoe, *Water pollution), (*American River Basin, *Water resources), (*Truckee River Basin, *Water resources), (*Nevada, Water resources), (*California, Water resources).

The purpose of the study is to present the results of a preliminary evaluation of the effects on water quality and water users resulting from proposed U. S. Bureau of Reclamation diversion schemes which would transport water from the upper reaches of the American River to the Lake Tahoe - Truckee River Basin. (Author Modified Abstract)

PB-217 066
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
WATER QUALITY CONTROL STUDY, NISHNABOTNA RIVER BASIN, IOWA AND MISSOURI.
Nov 67, 35p

Descriptors: (*Nishnabotna River Basin, *Reservoirs), (*Iowa, *Water resources), (*Missour, *Water resources).

The purpose of this study is to determine the present and future needs and value of storage for streamflow regulation for quality control in the Nishnabotna River Basin, a tributary of the Missouri River. The study covers requirements for streamflow regulation for quality control during the study period of 1970 to 2070. The study area includes parts of the following Iowa counties: Fremont, Page, Mills, Montgomery, Pottawattamie, Cass, Shelby, Audubon, Crawford, and Carroll and a small part of Atchison County in Missouri. (Author Modified Abstract)

PB-217 067
Public Health Service, Cincinnati, Ohio. Water and Sanitation Investigations.
WEST FORK RIVER INVESTIGATION. MONETARY BENEFITS TO POLLUTION ABATEMENT BY FLOW REGULATION FROM WEST FORK RESERVOIR, BROWNSVILLE, WEST VIRGINIA,
M. LeBosquet, Jr. Dec 47, 31p

Descriptors: (*West Fork River, *Water pollution), (*West Virginia, Water pollution), Stream flow, Flow rate.

The present investigation has been confined largely to the question of pollution abatement, leaving to the U. S. Engineer Office any benefits to West Fork River water supplies, both municipal and industrial, resulting from increased flow in West Fork River. However, benefits to public and industrial water supplies in the Monongahela River due to improved quality resulting from the increased flow, have been included in the present investigation. Studies of the West Fork River Basin were conducted in 1940 at the time of the Ohio River Pollution Survey, and the report on this work is available in House Document 266, 78th Congress, 1st Session, page 355, Monongahela River Basin. (Author Modified Abstract)

PB-217 068
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
EFFECTS OF THE SAN JOAQUIN MASTER DRAIN ON WATER QUALITY OF THE SAN FRANCISCO BAY AND DELTA.
Jan 67, 144p
Report on Central Pacific Basins Project.

Descriptors: (*San Joaquin Valley, *Water pollution), (*California, Water pollution), Drains.
Identifiers: *Water pollution control.

The U. S. Bureau of Reclamation and the California Department of Water Resources jointly plan to construct a master drain in the San Joaquin Valley for the purpose of collecting and transporting highly saline agricultural drainage waters to a disposal point in the Sacramento - San Joaquin Delta near the City of Antioch. From its inception late in 1965 the Central Pacific Basins Comprehensive Water Pollution Control Project of the Federal Water Pollution Control Administration (FWPCA) has devoted its resources to a detailed investigation of this complex problem. This report summarizes the findings of that investigation. (Author Modified Abstract)

PB-217 069
Public Health Service, Dallas, Tex. Western Gulf and Colorado River Drainage Basins Office.
REPORT UPON WATER POLLUTION CONTROL GUADALUPE RIVER BASIN (LAVACA, NAVIDAD, GUADALUPE AND SAN ANTONIO RIVERS).
Water pollution series.

Aug 51, 65p PHS-WPS-34

Descriptors: (*Guadalupe River Basin, *Water pollution), (*Texas, Water pollution).

The report on the Guadalupe River Basin has been prepared to aid in the continued development of the water pollution program to protect the waters of the basin. It is a summary of information and data available as of August 1951 on the uses to

which the water resources are put, the pollution reaching the watercourses and the damages resulting from that pollution, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those which are required. This report will serve to publicize the water pollution situation and direct the responsibility for needed corrective measures to municipalities and industries involved. (Author Modified Abstract)

PB-217 070
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, PACIFIC COASTAL STREAMS, SAN MATEO COUNTY, CALIFORNIA. A REPORT ON FUTURE WATER SUPPLY AND QUALITY CONTROL NEEDS AND BENEFITS.
Aug 66, 58p

Descriptors: (*California, *Water resources), Reservoirs, Forecasting.
Identifiers: *San Mateo County (California).

The purpose of the research was to estimate the present and future need for and value of municipal and industrial water supply and to evaluate the need for and value of storage for water quality control. Both water supply and quality control aspects were evaluated for the entire service area which includes all of San Mateo County, California, that drains to the Pacific Ocean. The evaluation period is 100 years, from 1975 to 2075. (Author)

PB-217 071
Public Health Service, Dallas Tex. Western Gulf and Colorado River Drainage Basins Office.
TRINITY RIVER SUB-BASIN (TRINITY AND SAN JACINTO RIVERS AND COASTAL STREAMS)-REPORT ON WATER POLLUTION.
Water pollution series.

Jan 52, 112p PHS-WPS-40
Prepared in cooperation with Texas State Dept. of Health.

Descriptors: (*Trinity River Basin, *Water pollution), (*San Jacinto River Basin, *Water pollution), (*Texas, Water pollution), Sewage, Industrial wastes.

The report on the Trinity River Sub-Basin has been prepared as an aid in the continued development of the water pollution control program for protection of the waters of the basin. It is a summary of information and data that were available January 1952 on the uses to which the water resources were put, the pollution reaching the watercourses and the damages resulting from that pollution, the benefits which may result from pollution prevention measures in effect and those pollution prevention measures which were required. The data presented bring together information collected by Federal, State and County agencies, municipalities and industries, and other interests concerned with the conservation and development of water resources. (Author)

PB-217 072
Federal Water Pollution Control Administration, Athens, Ga. Southeast Water Lab.
TEMPERATURE STUDIES LOWER BISCAYNE BAY, FLORIDA,
L. B. Tebo, Jr., R. L. Estes, and R. R. Lassiter.
Oct 68, 94p

Descriptors: (*Biscayne Bay, *Water pollution), (*Florida, Water pollution), Cooling water, Heat, Electric power plants.
Identifiers: *Thermal pollution.

The report was prepared primarily for parties involved in the thermal problems of Lower Biscayne Bay, Florida. It is now being made available to a somewhat larger group of scientists and engineers because of its contribution to the body of data rapidly developing in the field of thermal pollution. (Author Modified Abstract)

PB-217 073
Environmental Health Center, Cincinnati, Ohio.
INDUSTRIAL WASTE SURVEY REPORT. BETHLEHEM STEEL COMPANY, LACKAWANNA, NEW YORK: AUGUST 9 TO SEPTEMBER 30, 1948; DECEMBER 7, 1949 TO JANUARY 17, 1950; OCTOBER 16, 1951 TO NOVEMBER 15, 1951.
Industrial waste survey rept.

15 Nov 51, 195p
Report on a Study of the Characteristics of Liquid Wastes from an Integrated Steel Mill.

Descriptors: (*Iron and steel industry, *Water pollution), New York, Industrial wastes, Industrial waste treatment.
Identifiers: *Water pollution control, *Lackawanna (New York).

The study of process wastes from the Lackawanna Plant, Lackawanna, New York of the Bethlehem Steel Company was undertaken as part of the Public Health Service program of industrial waste studies. Three major waste sources of this integrated steel mill and outfall discharges of the entire plant were surveyed. Summaries of each of these studies are included.

PB-217 074
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
OUR MOULDY EARTH. A STUDY IN THE FUNGI OF OUR ENVIRONMENT WITH EMPHASIS ON WATER,
William Bridge Cooke. 1970, 800p

Descriptors: (*Fungi, *Water pollution), (*Aquatic microbiology, Fungi), (*Ecology, Fungi), Mine waters, Sewage treatment, Sludge digestion, Soil microbiology, Microbiology, Paper mills, Waste water, Indicator species.
Identifiers: Mine acid drainage.

Contents:
- Literature on fungi in sewage and polluted waters;
- Techniques for study of fungi;
- Aquatic fungi;
- Geofungi in streams;
- Fungi in streams carrying acid mine drainage;
- Fungi in sewage treatment systems;
- Fungi in relation to lignin and paper mill wastes;
- Indicator organisms;
- Fungi in the soil;
- Studies of environmental samples for fungi.

PB-217 075
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
WATER QUALITY CONTROL STUDY, LOWER MUSSELSHELL UNIT, MONTANA.

Sep 66, 33p

Descriptors: (*Musselshell River Basin, *Reservoirs), (*Montana, *Water resources), Minerals, Water pollution, Forecasting.

A survey has been made of the Musselshell River Basin and the Lower Musselshell Unit in particular which determined that waters of the area are highly mineralized. Waters stored in the proposed reservoir would not be of a sufficiently better mineral quality to improve water in the project area; and therefore, storage for water quality control has not been recommended. (Author)

PB-217 076
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY CONTROL AND MANAGEMENT, WILLAMETTE RIVER BASIN.
Summary rept.
Jan 67, 15p

Descriptors: (*Willamette River Basin, *Water pollution), (*Oregon, Water pollution).

The Federal Water Pollution Control Act (33 U.S.C. 466 et seq.) contains among its provisions a direction to the Secretary of the Interior to develop comprehensive programs for controlling pollution of interstate waters and their tributaries. The report is an interpretive summary of a report presenting such a program for Oregon's Willamette River.

PB-217 077
Environmental Health Center, Cincinnati, Ohio.
PRELIMINARY INVESTIGATION OF KRAFT MILL WASTES, CROSSETT PAPER MILLS, CROSSETT, ARKANSAS AS RELATED TO OUACHITA RIVER POLLUTION IN VICINITY OF ARKANSAS-LOUISIANA STATE LINE,
Hayse H. Black. Jun 49, 31p

Descriptors: (*Ouachita River, *Water pollution), (*Paper industry, Water pollution), (*Arkansas, Water pollution), Spent liquors (Pulping), Sulfates.
Identifiers: *Crossett (Arkansas).

Major destruction of fish has been reported in Ouachita River just below the Arkansas-Louisiana state line, on numerous occasions, during the past several years. These fish kills have been attributed to pollution resulting from promiscuous discharge of process wastes from the sulfate pulp mill located at Crossett, Arkansas. This investigation was requested by the U. S. Public Health Service, Washington Office, in a memorandum dated February 11, 1949. The purpose of this meeting was to discuss process wastes created by operations of Crossett Paper Mills as they relate to pollution of Ouachita River. (Author Modified Abstract)

PB-217 078
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
WATER POLLUTION PROBLEMS OF LAKE MICHIGAN AND TRIBUTARIES.

Jan 68, 98p

Descriptors: (*Lake Michigan Basin, *Water pollution), Meetings, Wisconsin, Illinois, Indiana, Michigan.

A conference was held in the matter of pollution of the waters of Lake Michigan and its trinbutary basin (Illinois-Indiana-Michigan-Wisconsin). The report prepared for the information of the conference and other interested parties, and for use by the conferees in their consideration of actions needed to improve and preserve the quality of waters. The report is based on studies and investigations by the Federal Water Pollution Control Administration, paralleling investigations made through cooperative agreements by other agencies of the Department of the Interior, and information obtained from other Federal agencies, agencies of the four Lake Michigan States, municipalities, universities, and others. (Author Modified Abstract)

PB-217 079
Public Health Service, Charlottesville, Va. Div. of Water Supply and Pollution Control.
A DIGITAL TECHNIQUE FOR CALCULATING AND PLOTTING DISSOLVED OXYGEN DEFICITS.
1965, 21p CB-SRBP-Technical Paper-1

Descriptors: (*Water pollution, *Dissolved gases), Computer programming, Oxygen, Chemical composition, Concentration (Composition).

A package program for use on the IBM 7090 computer is presented for obtaining a numerical solution of the classical Streeter-Phelps oxygen sag equation. Oxygen deficits are computed for each desired time and plotted as a function of time. In general, no knowledge on the reader's part is assumed with regard to computers or the program presented. Certain terminology having general use will be discussed in order to clarify the presentation; however, the step-by-step instructions should enable engineers and scientists to obtain correct results without a thorough knowledge of computer terminology. (Author)

PB-217 080
National Marine Fisheries Service, Ann Arbor, Mich. Great Lakes Fishery Lab.
PHYSICAL AND ECOLOGICAL EFFECTS OF WASTE HEAT ON LAKE MICHIGAN.
Sep 70, 105p

Descriptors: (*Water pollution, Heat), (*Lake Michigan, Water pollution), Heat flux, Ecology.
Identifiers: *Thermal pollution, Eutrophication.

Contents:
Description of Lake Michigan;
(Inshore waters, Open lake);
Thermal loading;
(Present loading, Future loading (through year 2000), Waste heat dissipation);
Effects of temperature fluctuations on Lake Michigan fish;
Eutrophication;
Ecological ramifications of the addition of waste heat to Lake Michigan.

PB-217 081
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION AND HEALTH: GENERAL DESCRIPTION OF A STUDY IN NASHVILLE, TENNESSEE,
Louis D. Zeidberg, Jean J. Schueneman, Paul A. Humphrey, and Richard A. Prindle. 1960, 35p
Prepared in cooperation with Vanderbilt Univ., Nashville, Tenn. and Public Health Service, Washington, D. C.

Descriptors: (*Public health, *Air pollution), (*Tennessee, Air pollution).
Identifiers: *Air pollution effects (Humans), *Nashville (Tennessee).

The Public Health Service Air Pollution Medical and Air Pollution Engineering Programs have conducted a joint study of air pollution in Nashville, Tennessee, with the School of Medicine of Vanderbilt University. Objectives of the study were to investigate possible relationships between air pollution and the health of people and to obtain information on a number of aspects of the engineering and meteorological aspects of air pollution. The four phases of the medical study are described. They include a morbidity survey, a mortality survey, a clinical study of individuals with known chronic cardiorespiratory disease, and an anthracosis study of autopsied individuals. The extensive aerometric studies are described in terms of objectives and equipment and methods used. General descriptive information concerning the study area is presented. (Author)

PB-217 082
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
CENTRAL MISSOURI RIVER DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series.

Jun 52, 66p PHS-Pub-130, PHS-WPS-24

Descriptors: (*Missouri River Basin, *Water pollution), (*North Dakota, Water pollution).

The report is produced under the cosponsorship of the Nebraska Department of Health, North Dakota State Department of Health, South Dakota State Department of Health, Wyoming Department of Public Health, and the Public Health Service. It is based on data available as of March 1, 1952, on sources of pollution, treatment facilities employed, and stream conditions. The report also presents information concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect and those which appear to be needed. (Author Modified Abstract)

PB-217 083
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
SIMULATION OF THE TIME-DEPENDENT PERFORMANCE OF THE ACTIVATED SLUDGE PROCESS USING THE DIGITAL COMPUTER,
Robert Smith, and Richard G. Eilers. Oct 70, 72p

Descriptors: (*Activated sludge process, Mathematical models), (*Sewage treatment, Activated sludge process), Automation, Computerized simulation, Computer programs.

One challenging and unsolved problem associated with wastewater treatment technology is the development of a mathematical model capable of simulating the time-dependent performance of the activated sludge process, especially a representation of the time-dependent characteristics of the final settler. The goal of automatic control is to produce an effluent which is of better average quality than that which can be achieved without control and to minimize the variation of effluent quality with time.

PB-217 084
Federal Water Pollution Control Administration, Washington, D.C. Div. of Technical Support.
SEWAGE TREATMENT CONTRACT AWARDS BY LOCATION, 1967.
1967, 15p

Descriptors: (*Sewage treatment, *Contracts), Tables (Data).
Identifiers: *Sewage treatment plants.

The listing represents the locations of the contract awards in sewage treatment works. The total of 241 new plants for the United States shown includes lagoons.

PB-217 085
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
SNAKE RIVER TRANSECT STUDY. STATION NO. 153018, 29-30 JULY 69,
Gary L. Burns. Apr 70, 43p Working Paper-74

Descriptors: (*Snake River, *Water pollution), (*Washington (State), Water pollution).
Identifiers: *Water quality data.

The Federal Water Pollution Control Administration Pollution Surveillance Branch, maintains a system of water quality sampling stations on interstate waters in the Northwest Region. Throughout the year the water samples are collected at these stations and analyzed, and the data are used to evaluate water quality. Knowledge of conditions peculiar to these stations is valuable in the evaluation of the data obtained. This study documents conditions at Station No. 153018 located on the Snake River seven miles downstream from the Lewiston-Clarkston bridge. Diurnal and spatial variances occurring at the station were observed during a 24-hour period. (Author Modified Abstract)

PB-217 135
Federal Water Pollution Control Administration, Cincinnati, Ohio. Div. of Technical Support.
BLACK-WATER IMPOUNDMENT INVESTIGATIONS,
Richard W. Warner, R. Kent Ballentine, and Lowell E. Keup. 1969, 103p

Descriptors: (*Northeast Cape Fear River, *Reservoirs), (*North Carolina, Water pollution), (*Water pollution, Northeast Cape Fear River), Lake Wilson.

In late July and early August, 1968, a study was conducted to predict the quality of Northeast Cape Fear River waters to be impounded in Kornegay Reservoir, Duplin County, North Carolina. This study was requested by the Corps of Engineers because the highly colored river water will inundate rich organic soils and vegetation that may leach undesirable materials and affect water quality adversely for fish propagation, wildlife, flow augmentation, water supply, and recreation. To assess the magnitude of the problem and to predict the effects of removal of vegetation and soils from the reservoir site, chemical and biological conditions of the Northeast Cape Fear River were compared with those of two small reservoirs with highly colored influents near Wilson, N. C. (Author)

PB-217 136
Federal Water Pollution Control Administration, Washington, D. C.
TRANSCRIPT OF PROCEEDINGS: PROGRESS EVALUATION MEETING IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE MISSOURI RIVER, OMAHA, NEBRASKA, AREA (NEBRASKA-IOWA-MISSOURI-KANSAS). HELD AT OMAHA, NEBRASKA ON 8 MARCH 1967.
1973, 117p

Descriptors: (*Missouri River, *Water pollution), (*Nebraska, Water pollution), (*Iowa, Water pollution), (*Missouri, Water pollution), (*Kansas, Water pollution).
Identifiers: *Omaha (Nebraska).

The report contains the recorded minutes of a meeting held in Omaha, Nebraska relative to problems and corrective measures pertaining to water pollution and treatment by cities adjacent to the Missouri River system. Included in the report are the rules and regulations of the industrial waste ordinance for the city of Omaha.

PB-217 137
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
A MATHEMATICAL MODEL FOR PREDICTING TEMPERATURES IN RIVERS AND RIVER-RUN RESERVOIRS,
John R. Yearsley. Mar 69, 88p Working Paper-65

Descriptors: (*Columbia River, Heat flux), (*Stream pollution, Heat), (*Water pollution, Heat), Mathematical models, Cooling water, Computer programs, Streamflow.
Identifiers: *Thermal pollution.

A one-dimensional temperature prediction model has been developed and tested on the Columbia River. The model in its present form is operational for use on rivers for which: Cross-sectional characteristics, including water surface width and cross-sectional area are available; adequate meteorologic data is available; water surface elevation data is available; evaporation and sensible heat flux can be evaluated in terms of regional weather data and the results of representative field studies;lateral and vertical variations in temperature are negligible; and the flow can be considered quasi-steady. (Author Modified Abstract)

PB-217 139
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.

LOWER PLATTE RIVER BASIN WATER POLLUTION INVESTIGATION.

Jun 50, 221p

Descriptors: (*Platte River Basin, *Water pollution), (*Nebraska, Water pollution).

The investigation on the Lower Platte River Basin included: the extent, types and major sources of pollution; a review of existing laws and pending legislation regarding pollution of public waters in the State of Nebraska; information regarding the bacteriological quality of water at present and proposed diversion points and in existing irrigation canals; minimum stream flows below the reservoirs necessary for water supply and sanitation purposes with present and contemplated pollution; quality of water for municipal and other public uses; possible benefits to pollution abatement by reservoir releases; and, existing plans and further recommendations for pollution abatement.

PB-217 140
Pacific Northwest Water Lab., Corvallis, Oreg.
FEASIBILITY OF ALTERNATIVE MEANS OF COOLING FOR THERMAL POWER PLANTS NEAR LAKE MICHIGAN.
Aug 70, 120p

Descriptors: (*Electric power plants, *Cooling systems), (*Industrial waste treatment, *Cooling systems), Feasibility, Performance evaluation, Cooling towers, Lagoons (Ponds), Cost estimates.
Identifiers: *Water pollution control, *Thermal pollution, Dry methods, Wet methods.

The report presents an evaluation of various methods of dissipating waste heat from thermal power plants near Lake Michigan. The feasibility of the cooling methods are considered from both an engineering and economic standpoint. It must be emphasized at the outset that the following analyses are directed towards determining the feasibility of various cooling methods; no attempt is made to optimize any particular plant or site. In addition to determining the engineering and economic feasibility of cooling devices; the effect of their operation on the environment is examined.

PB-217 141
Federal Water Pollution Control Administration, Washington, D.C.
RESEARCH NEEDS FOR WATER QUALITY CRITERIA.

1968, 111p
Report by the National Technical Advisory Committee on Water Quality Criteria.

Descriptors: (*Water pollution, *Research management), (*Water quality, Requirements), Planning, Dissolved gases, Oxygen, Temperature, Bacteria, Odors, Ecology, Standards.

The unknowns still outweigh the knowns in the area of water quality requirements. Needs include such things as: Determining the limiting and desirable levels of dissolved oxygen and temperature necessary to protect aquatic life; Defining acceptable bacteriological limits in waters used for recreation; Defining limits on minerals and taste and odor causing materials in waters used for agriculture and public water supplies; and Determining the chronic effects which minute concentrations of countless pollutants might have upon life systems. All of these problems and others, such as sampling techniques and analytical procedures, are referred to in the report.

PB-217 142
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ENGINEERING STUDIES OF COFFEE MILL WASTES IN EL SALVADOR, C. A., OCTOBER 18-NOVEMBER 9, 1960,
Hayse H. Black. Apr 61, 57p

Report to International Cooperation Administration, United States of America Operations Mission to El Salvador.

Descriptors: (*El Salvador, *Water pollution), (*Food processing, *Industrial waste treatment).
Identifiers: *Coffee processing, *Water pollution control.

The report pertains to control and treatment of both solid and liquid wastes from processing coffee in El Salvador. Included are: Notes on conferences and observations pertaining to wastes from processing coffee in El Salvador during the period October 18 to November 9, 1960; Review of technical literature dealing with control and treatment of liquid wastes resulting from the processing of coffee; and Future research on coffee wastes.

PB-217 143
Federal Water Pollution Control Administration, Cincinnati, Ohio. Div. of Pollution Surveillance.
TEMPERATURE AND AQUATIC LIFE.
Laboratory investigations no. 6.

Dec 67, 162p

Descriptors: (*Aquatic biology, Heat), (*Water pollution, Heat), (*Water pollution, Heat), (*Ecology, Aquatic biology), Temperature, Bacteria, Fresh water fishes, Benthos, Physiology.
Identifiers: *Thermal pollution, *Water pollution effects (Animals), *Water pollution effects (Plants).

Because of the importance of the single environmental facet to aquatic ecology, the report was developed to consider some of the features of temperature and its interrelationships. It is divided into five segments; these are: Chemical reactions; Bacteria; Freshwater fishes; Marine, estuarine and anadromous fishes; Aquatic plants and benthos. An extensive temperature bibliography is appended.

PB-217 144
Public Health Service, Portland, Oreg. Economic Studies Group.
WEISER RIVER BASIN (IDAHO) PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.

30 Oct 62, 14p Working Paper-32
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Weiser River Basin, *Economic development), (*Idaho, Econoic development), River basin development.
Identifiers: *Washington County (Idaho), *Adams County (Idaho).

The analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the area. The study period is the 50-year period 1960-2010, with an interim point at 1985. (Author)

PB-217 145
California Univ., Davis. Dept. of Water Science and Engineering.
A STUDY OF NITRATE AND MINERAL CONSTITUENTS FROM TILE DRAINAGE IN THE SAN JOAQUIN VALLEY, CALIFORNIA,
L. D. Doneen. Nov 66, 51p
Report on Central Pacific River Basins Project.

Descriptors: (*San Joaquin Valley, *Water pollution), (*Tile drains, San Joaquin Valley), (*California, Water pollution), Inorganic nitrates, Minerals, Ground water, Subsurface drainage.

The object of this study is to determine the origin of the salines particularly nitrate-nitrogen and its source, as from irrigation water, fertilizers, the soil profile, or a natural accumulation in the ground water. For this purpose three drainage areas were selected where the salinity and nitrates in the effluent, according to DWR tests, were present in appreciable quantities.

PB-217 146
Federal Water Pollution Control Administration, Kansas City, Mo. Missouri Basin Region.
WATER QUALITY CONTROL STUDY, BIG SIOUX RIVER BASIN, IOWA, MINNESOTA AND SOUTH DAKOTA. STUDY OF THE NEEDS AND VALUE OF STORAGE FOR WATER QUALITY CONTROL.
Sep 69, 45p
Errata sheet inserted.

Descriptors: (*Big Sioux River Basin, *Water pollution), (*Iowa, Water pollution), (*Minnesota, Water pollution), (*South Dakota, Water pollution).

The purpose of the study was to determine the present and future needs and value of storage for streamflow regulation for quality control in the Big Sioux River Basin, a tributary of the Missouri River. The study period covered requirements for streamflow regulation for quality control from the present to 2070. The Big Sioux River Basin includes parts of the following counties: Day, Roberts, Grant, Clark, Codington, Deuel, Hamlin, Kingsbury, Brookings, Lake, Moody, Minnehaha, Union and Lincoln in South Dakota; Lincoln, Pipestone, Murray, Rock and Nobles in Minnesota; and Lyon, Osceola, Sioux, and Plymouth in Iowa. (Author)

PB-217 147
Federal Water Pollution Control Administration, Tampa, Fla. Hillsborough Bay Technical Assistance Project.
PROBLEMS AND MANAGEMENT OF WATER QUALITY IN HILLSBOROUGH BAY, FLORIDA.
Dec 69, 136p

Descriptors: (*Florida, Water pollution), (*Odors, Water pollution), (*Hillsborough Bay, *Water pollution).
Identifiers: *Tampa (Florida), *Water quality data.

The residents of the city of Tampa have reported obnoxious odors along the western shore of Hillsborough Bay for many years. This odor had historically been associated with excessive growths of attached algae and general poor water quality attributable to waste discharges. At the request of local authorities and the Florida State Board of Health, FWPCA initiated extensive field and laboratory investigations in Hillsborough Bay in June 1967. The objectives of these studies were: to identify and quantify key sources of waste in Hillsborough Bay and to determine their effect on water use; to determine the cause or causes of noxious odors in Hillsborough Bay and; to recommend means of modifying conditions in Hillsborough Bay to eliminate the causes of obnoxious odors and make possible other desirable uses.

PB-217 148
Public Health Service, Philadelphia, Pa. Div. of Water Supply and Pollution Control.
DELAWARE ESTUARY COMPREHENSIVE STUDY. WATER USE ADVISORY COMMITTEE GUIDE.

Dec 64, 57p

Descriptors: (*Delaware Estuary, *Water resources), Manuals.

The Delaware Estuary Comprehensive Study requests that the sub-committees of the Water Use Advisory Committee undertake as their initial task, the preparation of the first part of a report on the present and future use and needs of the or-

ganizations represented, relative to the waters in the estuary. The guide was prepared to simplify these tasks for the sub-committee members, and to assist members in eliciting responses from the organizations they represent. Part I of this guide briefly explains (1) the DECS and (2) the current quality and uses of the waters of the Delaware Estuary. Part II deals with ASSIGNMENTS. Part III contains certain reference materials that should be useful to all members of the four sub-committees.

PB-217 149
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
NATIONAL EUTROPHICATION RESEARCH PROGRAM ANNUAL NEWSLETTER.
Jul 70, 16p

Descriptors: (*Limnology, Research).
Identifiers: *Eutrophication.

Contents:
Research and development in eutrophication;
Seminars, workshops and symposia;
Publications;
Grant and Contract research;
Services available;
Who's who in the national eutrophication research program;
Plans for FY-71.

PB-217 150
Los Angeles County Air Pollution Control District, Calif.
EMISSIONS OF OXIDES OF NITROGEN FROM STATIONARY SOURCES IN LOS ANGELES COUNTY.
Rept. no. 1,
Robert L. Chass. 1959, 56p
Prepared in cooperation with Public Health Service, and California State Dept. of Public Health.

Descriptors: (*Air pollution, *Nitrogen oxides), (*California, Air pollution), Gas sampling.
Identifiers: *Los Angeles (California).

The report describes air pollution caused by oxides of nitrogen produced from stationary sources. Sampling methods and equipment used to determine quantitative analyses of pollutants are described.

PB-217 151
Public Health Service, Washington, D.C. Div. of Air Pollution.
AN APPRAISAL OF AIR POLLUTION IN SPARTANBURG, SOUTH CAROLINA,
G. B. Welsh. Apr 62, 50p
Prepared in cooperation with the City of Spartanburg, S.C., and the South Carolina State Board of Health.

Descriptors: (*South Carolina, *Air pollution).
Identifiers: *Spartanburg (South Carolina), *Air quality data.

At the request of the City of Spartanburg and the South Carolina State Board of Health, an appraisal of factors relating to the air pollution problem in Spartanburg, South Carolina, was undertaken by the Division of Air Pollution of the Public Health Service. The purpose of this appraisal was to determine the general nature and extent of the air pollution problem and to develop general recommendations for activities to meet present and future air pollution problems in Spartanburg. This report is based on data obtained from existing information, brief inspection visits, and a seven-day continuous air sampling study. (Author Modified Abstract)

PB-217 152
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER TEMPERATURE -- INFLUENCES, EFFECTS AND CONTROL. PROCEEDINGS OF THE TWELFTH PACIFIC NORTHWEST SYMPOSIUM ON WATER POLLUTION RESEARCH CONDUCTED BY U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE AT THE PACIFIC NORTHWEST WATER LABORATORY IN CORVALLIS, OREGON ON NOVEMBER 7, 1963,
Edward F. Eldridge. Apr 67, 163p

Descriptors: (*Water pollution, Heat), (*Reservoirs, Temperature), Stratification.
Identifiers: *Thermal pollution.

Contents: Temperature as a water quality parameter; Effects of water uses and impoundments on water temperature; Water temperature requirements for maximum productivity of salmon; The effects of temperature on disease in fish; Temperature studies on the Umpqua River, Oregon; Temperature phenomena and control in reservoirs; Method of computing average reservoir temperature; Some observations of Columbia River and reservoir behavior from Hanford experience; Instrumentation for water-temperature studies; Summary of current theories and studies relating to temperature prediction.

PB-217 153
California Univ., Berkeley. Sanitary Engineering Research Lab.
TURBULENCE IN ORTHOKINETIC FLOCCULATION,
Yerachmiel Argaman, and Warren J. Kaufman. Jul 68, 170p SERL-68-5
Grant FWPCA-WP-00658

Descriptors: (*Flocculating, *Hydraulics), Chemical reactors, Mixing, Turbulent flow, Particle size, Numerical analysis.

The study shows the relationship between the rate of orthokinetic flocculation and the hydrodynamic parameters describing the internal structure of turbulence in stirred reactors. Specifically, the study derives a theoretical expression for the frequency of collisions between particles suspended in a turbulent fluid, in which the particles are larger than the smallest scale of the turbulence; develops a working formula expressing the degree of flocculation obtained in a continuous flow system as a function of the hydrodynamic parameters and physical properties of the system; verifies experimentally the proposed theory through the simultaneous determination of flocculation performance and hydrodynamic characteristics; and develops design criteria and operational considerations for full scale treatment plants.

PB-217 154
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
JAMES RIVER BASIN WATER POLLUTION INVESTIGATION.
Water pollution series.
Apr 52, 144p PHS-Pub-187, PHS-WPS-35
Prepared in cooperation with the North Dakota Dept. of Health, South Dakota Dept. of Health, and the Bureau of Reclamation.

Descriptors: (*James River Basin, *Water pollution), (*North Dakota, Water pollution), (*South Dakota, Water pollution).

The Missouri Drainage Basin Office, Division of Water Pollution Control, Public Health Service, in close cooperation with the respective State water pollution control agencies, initiated development of the water pollution investigations of the James River Basin. Activities were carried out jointly with the State water pollution control agencies and in close cooperation with various Federal agencies, who furnished laboratory assistance, information on water supply use, sources of pollution, stream flows at various points, and helped in other phases of the work. (Author Modified Abstract)

PB-217 155
Federal Water Pollution Control Administration, Athens, Ga. Southeast Water Lab.
EFFECTS OF POLLUTION ON WATER QUALITY, ESCAMBIA RIVER AND BAY, FLORIDA.
Jan 70, 177p

Descriptors: (*Escambia River, *Water pollution), (*Escambia Bay, *Water pollution), (*Florida, Water pollution).
Identifiers: *Water quality data.

Interstate and intrastate pollution from waste sources entering the Conechu-Escambia River downstream of Brewton, Alabama, and Escambia Bay near Pensacola, Florida was evaluated. An investigation of waste sources in Florida and Alabama and a detailed study of the receiving waters were conducted during the period of September 8-25, 1969 and October 22-30, 1969. The report presents an evaluation of the data collected during these studies. (Author Modified Abstract)

PB-217 156
Federal Water Pollution Control Administration, Cincinnati, Ohio. Analytical Quality Control Lab.
FWPCA METHODS FOR CHEMICAL ANALYSIS OF WATER AND WASTES.

Nov 69, 261p

Descriptors: (*Water analysis, *Water pollution), Acidity, Alkalinity, Aluminum, Arsenic, Biochemical oxygen demand, Trace elements, Calcium, Metals, Chlorides, Chlorine, Color, Cyanides, Dissolved gases, Oxygen, Minerals, Fluorides, Nitrogen, Oils, pH, Phosphorus, Silicon dioxide, Odors, Turbidity.
Identifiers: *Water pollution detection, Chemical oxygen demand.

The manual describes the analytical procedures selected for use in Federal Water Pollution Control Administration laboratories for the chemical analysis of water and waste samples. The methods were chosen by a committee of senior chemists from within the Administration, using Standard Methods for the Examination of Water and Wastewater, 12th Edition (1965) and ASTM Standards, Part 23, Water; Atmospheric Analysis (1968) as basic references. (Author Modified Abstract)

PB-217 157
University of Southern California, Los Angeles. Allan Hancock Foundation.
EDDY DIFFUSIVITY AND THE FOUR-THIRDS LAW IN NEAR-SHORE (COASTAL WATERS),
James E. Foxworthy. 1968, 78p 68-1
Grant FWPCA-WP-00931-03

Descriptors: (*Plumes, *Turbulent diffusion), (*Outfall sewers, Plumes), (*Oceans, Turbulent diffusion), Mathematical models, Coasts.
Identifiers: *Ocean waste disposal, Liquid waste disposal.

During the period from 1963 through 1968 a series of instaneous and continuous release dye experiments were conducted in the near-shore coastal waters off southern California. The results of these experiments have been interpreted in terms of two- and three-dimensional apparent coefficients of eddy diffusivity. During the course of this investigation, little evidence was found to substantiate the applicability of the so-called four-thirds law relating the instantaneous apparent diffusivity coefficients and the approximate eddy scale. The findings cast doubt on the direct applicability of the four-thirds law in the design of submarine waste outfalls or in predicting the behavior of other low density surface fields. (Author Modified Abstract)

PB-217 158
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.

WATER QUALITY CONTROL STUDY PASKENTA-NEWVILLE PROJECT THOMAS AND STONY CREEK BASINS CALIFORNIA.

May 67, 39p

Descriptors: (*Sacramento River Basin, *Reservoirs), (*California, *Water resources), (*Paskenta Reservoir, *Water resources), (*Newville Reservoir, *Water resources).

A study of the U. S. Bureau of Reclamation's proposed Paskenta-Newville Unit has revealed no need for reservoir storage for the purpose of regulating streamflow for water quality control in the Sacramento River Basin. Water quality detriments of the Paskenta-Newville Project can be mitigated by operation of this and other units of the Central Valley Project to maintain appropriate water quality standards in the Sacramento - San Joaquin Delta. (Author)

PB-217 159
Resources Research, Inc., Washington, D.C.
HARVESTING OF ALGAE BY FROTH FLOTATION.
Final rept.
9 Mar 64, 43p
Contract PH-86-63-75

Descriptors: (*Algae, *Harvesting), (*Flotation, Algae), (*Sewage treatment, Algae).
Identifiers: Chlorella pyrenoidosa, *Froth flotation, *Nutrient removal.

Efforts made during the current year have been concerned mainly with the determination and quantification of the factors that affect the economics of the froth flotation harvesting process. Three criteria can be used in evaluating the process: Percentage clarification of feed suspensions; Absolute amounts of harvest per unit of raw materials required; and Absolute amounts of harvest obtained per unit time. It was suggested that, for both unialgal cultures and lagooned sewage, froth flotation processing can be evaluated best in terms of actual amounts of material removed from or remaining in feed suspensions. (Author Modified Abstract)

PB-217 160
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE METROPOLITAN ST. LOUIS INTERSTATE AIR QUALITY CONTROL REGION (MISSOURI-ILLINOIS).

Dec 68, 69p APTD-1210

Descriptors: (*Air pollution, *Missouri), (*Illinois, Air pollution).
Identifiers: *Saint Louis Metropolitan Area, *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the Metropolitan St. Louis Missouri-Illinois area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-217 161
Los Angeles County Sanitation District, Calif.
PHOSPHATE REDUCTION FOR LIMITING ALGAE GROWTH IN LAKES OF RENOVATED WASTEWATER,
Franklin D. Dryden, and Gerald Stern. 1973, 42p
Contracts PH-86-65-14, PH-86-66-37
Presented at the American Chemical Society Meeting, New York City, 15 Sep 66.

Descriptors: (*Chemical removal (Sewage treatment), *Phosphorus), (*Sewage treatment, Chemical removal (Sewage treatment)).
Identifiers: *Tertiary sewage treatment.

The paper describes a pilot study conducted at Lancaster, California to reclaim sewage treatment effluent from oxidation ponds to a point where the water would be suitable for use in recreational lakes. Results are presented of investigations to determine limiting nutrients for algal growth and means of removing those nutrients.

PB-217 162
Public Health Service, Washington, D. C.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE MISSISSIPPI-DES MOINES-SKUNK RIVERS BASIN.
Water pollution series.

1953, 56P PHS-Pub-314, PHS-WPS-55
Prepared in cooperation with the State Water Pollution Control Agencies of Illinois, Iowa, Minnesota, and Missouri.

Descriptors: (*Mississippi River Basin, *Water pollution), (*Des Moines River Basin, *Water pollution), (*Skunk River Basin, *Water pollution), (*Iowa, Water pollution), (*Illinois, Water pollution), (*Minnesota, Water pollution), (*Missouri, Water pollution).

The report sets forth the water pollution control program being followed by the respective States in the Mississippi-Des Moines-Skunk Rivers Basin. This program, which is based on data available as of January 1, 1953, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 163
Public Health Service, Washington, D.C.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE RAINY RIVER BASIN.
Water pollution series.
1954, 10P PHS-Pub-380, PHS-WPS-68
Prepared in cooperation with the Minnesota State Water Pollution Control Agency, Minneapolis.

Descriptors: (*Rainy River Basin, *Water pollution), (*Minnesota, Water pollution).

The publication summarizes the 'Comprehensive Water Pollution Control Program for the Rainy River Basin' of the Minnesota State Water pollution control agency. The program is sound and gives full consideration to the several present uses and to the reasonably anticipated future uses of the waters of the basin. It provides an equitable balance in the pollution control requirements for various private and public groups concerned.

PB-217 164
Communicable Disease Center, Atlanta, Ga.
FLEAS OF PUBLIC HEALTH IMPORTANCE AND THEIR CONTROL.
Insect control series,
Harry D. Pratt, and John S. Wiseman. 1962, 40p
PHS-Pub-772-ICS-7
Prepared in coooperation with Texas State Dept. of Health, Austin.

Descriptors: (*Siphonaptera, *Disease vectors), (*Infectious diseases, Siphonaptera), (*Public health, Siphonaptera), Bites and stings, Bacterial diseases, Helminthic diseases, Rickettsial diseases, Physiology, Ecology, Anatomy, Taxonomy, Insect control, Rodents, Parasites.

Contents: The flea bite; Species commonly attacking man; Diseases transmitted by fleas; Biology of fleas; Identification of fleas; Flea control; Rodent ectoparasite surveys.

PB-217 165
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
HANDBOOK ON SANITATION OF RAILROAD PASSENGER CARS. STANDARDS OF SANITATION APPLICABLE TO THE CONSTRUCTION, OPERATION AND MAINTENANCE OF RAILROAD PASSENGER AND DINING CARS.
1964, 25p PHS-Pub-95-Rev-1964

Descriptors: (*Railroad cars, *Sanitary engineering), Manuals.

The handbook is designed to serve as a guide to persons who must apply recognized principles of sanitation to dining car construction, operation, and maintenance.

PB-217 166
Communicable Disease Center, Atlanta, Ga.
TICKS OF PUBLIC HEALTH IMPORTANCE AND THEIR CONTROL.
Insect control series,
Harry D. Pratt, and Kent S. Littig. 1962, 47p PHS-Pub-772-ICS-10

Descriptors: (*Public health, Ticks), (*Ticks, *Disease vectors), (*Infectious diseases, Ticks), Arthropoda, Bacterial diseases, Protozoal diseases, Rickettsial diseases, Viral diseases, Tropical diseases, Parasitic diseases, Anatomy, Physiology, Taxonomy, Ecology, Insect control.
Identifiers: *Blood sucking insects, Dermacentor andersoni, Amblyomma americanum, Dermacentor variabilis.

Contents:
Rickettsial diseases;
Bacterial diseases;
Spirochetal diseases;
Viral diseases;
Protozoal diseases;
Tick bite and tick paralysis;
The morphology of ticks;
The life history and habits of ticks;
Important tick species;
Control of ticks;
Tick surveys and identification.

PB-217 167
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
BACTERIOLOGICAL EFFECTS OF PRIMARY TREATMENT PLANT DISCHARGES AT BREMERTON, WASHINGTON.

Jul 70, 63p
Prepared in cooperation with Washington State Water Pollution Control Commission, Olympia.

Descriptors: (*Washington (State), Water pollution), (*Port Washington Narrows, *Water pollution), Sewage.
Identifiers: *Bremerton (Washington), *Sewage treatment effluent.

The report evaluates the bacteriological effects of primary treatment plant discharges at Bremerton, Washington. Sampling was undertaken to determine the general background level and distribution of total coliform bacteria in the waters of Sinclair Inlet and Port Washington Narrows and the effect discharge of primary chlorinated effluent through shallow marine outfalls has upon bacteriological water quality of Sinclair Inlet and Port Washington Narrows.

PB-217 168
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.

SEWAGE AND WATER WORKS CONSTRUCTION - 1964.

1964, 17p PHS-Pub-758-1964
Revision of report dated 1963.

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), Inventories.
Identifiers: *Sewage treatment plants.

The data is published to provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. The publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved.

PB-217 169
Public Health Service, Washington, D.C. Div of Water Supply and Pollution Control.
POLLUTIONAL EFFECTS OF STORMWATER AND OVERFLOWS FROM COMBINED SEWER SYSTEMS - A PRELIMINARY APPRAISAL.

Nov 64, 44p PHS-Pub-1246

Descriptors: (*Overflows, *Water pollution), (*Combined sewers, Overflows).
Identifiers: *Storm water runoff, *Water pollution control.

It is known that the overflows from combined sewer systems and the discharge of stormwater from storm sewers create real pollution problems. The report examines and assesses in a preliminary way existing data on stormwater and combined sewer overflows in regard to characteristics and pollutional effects, and investigates existing and possible corrective measures for dealing with the problem.

PB-217 170
Public Health Service, Washington, D.C. Div. of Engineering Services.
ENVIRONMENTAL HEALTH PLANNING GUIDE. AIR POLLUTION. SEWERAGE, WATER, HOUSING. REFUSE.

1973, 65p PHS-Pub-823

Descriptors: (*Public health, Pollution), (*Pollution, *Urban planning), Air pollution, Water pollution, Sewage, Waste disposal, Residential buildings, Abatement.

Today the explosive population growth and the continued concentration of people, production and services in metropolitan areas are making the environmental health problems still more complex and difficult. Polluted water and air, open refuse dumps, substandard housing and overflowing septic tanks are now among the most urgent community problems. There are no standard answers to a community's problems. The solutions will vary depending on local conditions. This guide presents a systematic approach to a community's environmental health problems by describing the steps and procedures that have been found helpful in determining a community's needs. The guide emphasizes the evaluation of health-related utilities and services which readily lend themselves to long-range planning, and deals primarily with water, sewerage, refuse, air pollution and housing programs.

PB-217 171
Public Health Service, Washington, D.C.
HANDBOOK ON SANITATION OF VESSEL 'ONSTRUCTION. STANDARDS OF SANITA- 'ON AND RATPROOFING FOR THE CON-S' UCTION OF VESSELS.
19' '. 77p PHS-Pub-393

Descriptors: (*Naval architecture, *Sanitary engineering), Rats, Water storage.

The handbook presents minimum public-health standards relating to general sanitation and ratproofing in the construction of ships.

PB-217 172
Public Health Service, Washington, D.C.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE LAKE SUPERIOR DRAINAGE BASIN.
Water pollution series.
1954, 53P PHS-Pub-367, PHS-WPS-66
Prepared in cooperation with the State Water Pollution Control Agencies of Michigan, Minnesota, and Wisconsin.

Descriptors: (*Lake Superior, *Water pollution).

The report sets forth a water pollution control program for the Lake Superior Drainage Basin. This program, which is based on data available as of January 1, 1954, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and lakes, and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 173
Public Health Service, Washington, D.C.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE MISSISSIPPI--SALT RIVERS BASIN.
Water pollution series.
1954, 28P PHS-Pub-366, PHS-WPS-65
Prepared in cooperation with the State Water Pollution Control Agencies of Illinois, Iowa, and Missouri.

Descriptors: (*Mississippi River Basin, *Water pollution), (*Salt River Basin, *Water pollution), (*Illinois, Water pollution), (*Iowa, Water pollution), (*Missouri, Water pollution).

The report sets forth the water pollution control program being followed by the respective States in the Mississippi-Salt Rivers Basin. This program, which is based on data available as of January 1, 1954, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 174
Environmental Health Center, Oak Ridge, Tenn.
SLAUGHTERHOUSE AND PACKING HOUSE WASTES: THEIR TREATMENT AND DISPOSAL. ANNOTATED BIBLIOGRAPHY,
Conrad P. Straub. Jul 51, 35p

Descriptors: (*Food processing, *Industrial waste treatment), (*Bibliographies, Industrial waste treatment).
Identifiers: *Slaughtering house wastes, *Water pollution control.

The annotated bibliography was prepared in conjuction with a critical study of the literature relating to the treatment and disposal of slaughterhouse and packing house wastes. The bibliography was culled from such sources as Chemical Abstracts and Engineering Index, together with bibliographies listed by authors in published papers. In so far as possible the original papers were examined. In some cases, particularly with foreign reference material, only an bastract was readily available. All entries are listed in accordance with the year of publication, or, in some instances, under the date of the abstract. The references are listed in alphabetical order according to the author under each year of entry.

PB-217 175
Federal Water Pollution Control Administration, Washington, D.C.
CONFERENCE TO CONSIDER THE IOWA WATER QUALITY STANDARDS FOR THE MISSISSIPPI RIVER BASIN INTERSTATE WATERS - STATE OF IOWA. HELD AT DAVENPORT, IOWA ON 8-9 APRIL 1969.

1969, 668p

Descriptors: (*Mississippi River Basin, *Water pollution), (*Iowa, Water pollution), Standards.

The report contains the minutes, discussions, and papers presented relative to a conference held in Iowa to establish water quality standards for interstate waters.

PB-217 176
Syracuse Univ., N.Y. Dept. of Chemical Engineering and Metallury.
MASS TRANSFER ANALYSIS IN REVERSE OSMOSIS OPERATION.
Progress rept. 1 Mar-Dec 68.
Dec 68, 101p
Grant PHS-WP-00968-02

Descriptors: (*Osmosis, Mass transfer), Research, Turbulent flow, Mathematical models.
Identifiers: *Reverse osmosis.

The purpose of this report is to present a summary of the major achievement of the work performed during the period March 1968 to December 1968 in connection with the research Grant WP-00968-02, 'Mass Transfer Analysis in Reverse Osmosis Operation', and the significance and relevance of these results to the use of R.O. in waste water treatment. The objective of this program is to carry out an analysis on the mass transfer characteristics of reverse osmosis, especially in connection with its application on waste water treatment.

PB-217 177
Public Health Service, Washington, D.C.
REPORT ON SPECIAL SANITARY PROBLEMS IN CONNECTION WITH THE SANITATION OF THE EXTRA-CANTONMENT ZONE AROUND FORT LEAVENWORTH, KANSAS,
Harry B. Hommon. 9 Nov 17, 77p

Descriptors: (*Kansas, *Water treatment), Typhoid, Public health.
Identifiers: *Leavenworth (Kansas).

The report is made up of the following special studies: Report on the Leavenworth city water supply; City ordinances covering -- the construction and operation of privy vaults and disposal of manure, and the collection and disposal of garbage; Recommendations for remodeling the sewage disposal plant at the Leavenworth County Hospital; A report to the Consumers' Ice Company of Leavenworth, regarding the handling of the water used for making ice, and an article to be published in 'Ice and Refrigeration' on the subject of filtering and storing water in distilled water ice plants.

PB-217 178
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
FLATHEAD LAKE BACTERIOLOGICAL STUDY,
Ralph R. Bauer. Apr 69, 61p

Descriptors: (*Flathead Lake, *Coliform bacteria), (*Water pollution, Flathead Lake), (*Montana, Water pollution), Biological surveys.

The purpose of this survey was to determine the concentration and distribution of coliform bacteria present in Flathead Lake, Montana, during a heavy use period as compared with the applicable state water quality standards. The study was undertaken during the summer of 1968 and consisted chiefly of a sampling and analytical program designed to permit a bacteriological evaluation of Flathead Lake water quality during periods of peak water use. (Author Modified Abstract)

PB-217 179
Public Health Service, Portland, Oreg. Economic Studies Group.
WILLAMETTE RIVER BASIN (OREGON) WATER USE TRENDS AND ESTIMATE OF GROWTH, 1960-2010.
5 Nov 62, 31p Working Paper-34
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River Basin, *Water resources), (*Oregon, Water resources).

The purpose of the study is to describe the uses for water in which quality is important. These provide a basis for establishing water quality objectives. These water quality objectives, in turn, are used to compute the stream flow requirements needed for water quality management purposes. (Author)

PB-217 180
Public Health Service, Portland, Oreg. Economics Studies Group.
WILLAMETTE RIVER BASIN (OREGON) IRRIGATION TRENDS.
20 Nov 62, 13p Working Paper-35
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River Basin, *Irrigation), (*Oregon, *White resources).

In order to provide a basis for anticipating future irrigation needs, and in order to relate irrigation to land requirements, irrigation trends (both historical and potential) in the Willamette River Basin are briefly examined in the report.

PB-217 181
Public Health Service, Washington, D.C.
SEWAGE AND WATER WORKS CONSTRUCTION, 1962.
Annual rept.,
William H. Mills, Jr., Elsie M. Gibson, and Florence G. Simmons. Apr 63, 16p PHS-Pub-758-1962

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), Inventories.
Identifiers: *Sewage treatment plants.

The annual report of 'Sewage and Water Works Construction 1962' is published as one part of the basic data program required and authorized in Public Law 660 (as amended by Public Law 87-88), the Federal Water Pollution Control Act. The data published herin provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. This publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved. (Author Modified Abstract)

PB-217 182
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SEWAGE AND WATER WORKS CONSTRUCTION, 1961.
Annual rept.,
William H. Mills, Jr., Elsie M. Gibson, and Florence G. Simmons. 1961, 17p PHS-Pub-758-1961

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), Inventories.
Identifiers: *Sewage treatment plants.

The annual report of 'Sewage and Water Works Construction 1961' is published as one part of the basic data program required and authorized in Public Law 660 (as amended by Public Law 87-88), the Federal Water Pollution Control Act. The data published herein provide a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. This publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved. (Author Modified Abstract)

PB-217 183
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
PLYWOOD PLANT GLUE WASTES DISPOSAL.
Final rept.,
Danforth G. Bodien. Jan 69, 89p FR-5

Descriptors: (*Glue, *Industrial waste treatment), (*Plywood, Industrial waste treatment), Phenols.
Identifiers: *Water pollution control, *Wood processing industry, Biological industrial waste treatment.

Plywood plants generate wastewater from the cleanup of glue mixing equipment and glue spreaders. Some of the wastes are toxic to fish and all are high in pollutional strength. Treatment of these glue wastes varies from plant to plant, but generally consists only of solids separation or the removal of suspended matter. Biological treatment investigations showed that BOD removals of 90+ percent can be attained where protein and urea glues are involved; however, this process proved unworkable for the phenolic glues and the process of incineration was shown to have good potential. Wastewater reuse offers the best waste disposal answer for the phenolic glues and possibly also for the protein and urea glues. (Author Modified Abstract)

PB-217 184
Federal Water Pollution Control Administration, Washington, D.C.
FEDERAL WATER POLLUTION CONTROL ACT. OIL POLLUTION ACT.

1973, 37p

Descriptors: (*Water pollution, *Legislation), National government.
Identifiers: Oil pollution.

The report contains the amended text of the Federal Water Pollution Control Act and the amended text of the Oil Pollution Act.

PB-217 185
Communicable Disease Center, Atlanta, Ga.
INTRODUCTION TO ARTHROPODS OF PUBLIC HEALTH IMPORTANCE. TRAINING GUIDE.
Insect Control Series,
Harry D. Pratt, Kent S. Littig, and Clarence W. Marshall. 1960, 39p PHS-Pub-772-1960

Descriptors: (*Arthropoda, *Disease vectors), (*Infectious diseases, Arthropods), (*Public health, Arthropods), Entomology, Allergic diseases, Anatomy, Physiology, Life cycles, Animal behavior, Ecology, Senses, Taxonomy, Insect control, Parasites.
Identifiers: Taxonomic keys.

Contents:
How insects affect man;
The external structure of insects;
The internal structure and physiology of insects;
The development of insects;
The senses of insects;
Insect behavior;
Classification of insects and related forms;
The classes of arthropods;
The orders of arachnids;
The orders of insects;
Insect identification.

PB-217 186
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
NATIONAL REGISTER OF SHELLFISH PRODUCTION AREAS.
Leroy S. Houser, and Frank J. Silva. 1966, 12p PHS-Pub-1500

Descriptors: (*Shellfish, *Fishing grounds), Water pollution.

The National Shellfish Sanitation Program is a cooperative State-Federal-Industry effort designed to assure to the consuming public the safety of shellfish (oysters, clams, and mussels) shipped in interstate commerce, and provide for continuing use of a valuable natural resource. The Program is concerned with the sanitary aspects of shellfish production, harvesting, processing, and distribution. The report presents data on shellfish production areas. The data covers the following points by State and by Region; number, size and classification of areas; location of areas by interstate and intrastate waters, and by active and inactive areas.

PB-217 187
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
A COMPREHENSIVE PROGRAM FOR CONTROL OF WATER POLLUTION IN THE MISSOURI DRAINAGE BASIN.
Jul 53, 132p PHS-Pub-317, PHS-WPS-56
A Cooperative State-Federal Report on Water Pollution.

Descriptors: (*Missouri River Watershed, *Water pollution), Industrial wastes, Sewage, Tables (Data).

The report discusses the ways our water resources are used, the pollution going into our water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and the pollution control measures required. Fourteen sub basins of the Missouri River drainage area are reviewed.

PB-217 188
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
UNIVERSAL FACTORS IN AEROBIC BIOLOGICAL PURIFICATION,
M. B. Ettinger. 1957, 16p
Presented at the Annual Meeting of the Central States Sewage and Industrial Wastes Association (30th), June 1957.

Descriptors: (*Sream pollution, *Limnology), (*Aquatic microbiology, Limnology), Nutrients.
Identifiers: *Self purification.

The recurrent pattern of oxidative food usage by microorganisms and oxidative destruction of cell substance in unfed cultures has been described, and it has been noted that these phenomena are essentially similar in natural stream purification and in activated sludge and trickling filter systems. The universal effect of nutritional deficiencies on growth characteristics has been described and the effect of nutritional deficiencies on growth and oxidation analyzed. The sewage treatment plant has been noted to undergo a daily cycle with excess oxidation capacity at night because of reduced load. Algal photosynthesis has been analyzed in terms of its effect on oxidative purification processes. (Author)

PB-217 189
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
PRELIMINARY REPORTS OF PROGRESS - LABORATORY STUDIES, WATER DECONTAMINATION. III. STUDIES ON CE144, Y91, AND I131,
Conrad P. Straub, T. W. Brockett, Jr., and Robert Stepp. 3 May 51, 14p

Descriptors: (*Water treatment, *Radioactive contaminants), (*Chemical removal (Water treatment), *Radioactive isotopes).

Radiochemical analyses of the effluent obtained from the alum treatment of a simulated nuclear bomb blast mixture in an experimental water treatment plant showed that radioelements were removed in varying amounts. These data also indicated higher and lower removals than those that had been reported earlier when only single radioisotopes were subjected to similar treatment processes. Thus a series of jar test studies were made in which single isotopes and mixtures of isotopes were subjected to similar treatment processes to obtain data on removals. Such studies would show whether certain radioisotopes would be more easily removed when combined with other isotopes or whether such combinations would interfere with removals of the specific isotopes. (Author Modified Abstract)

PB-217 190
Pittsburgh Chemical Co., Pa. Research and Development Dept.
THE REMOVAL OF ORGANIC CONTAMINANTS FROM SECONDARY SEWAGE EFFLUENTS USING GRANULAR REGENERABLE ACTIVATED CARBON.
Interim rept. 20 Sep 61-19 Sep 62,
R. S. Joyce, and V. A. Sukenik. 1962, 37p
Contract SAph-86-62-15

Descriptors: (*Sewage treatment, *Activated carbon treatment), Performance evaluation, Surfactants, Organic compounds, Regeneration (Engineering).
Identifiers: *Tertiary sewage treatment.

The current study was initiated to obtain an approximation of the optimum bed depth and flow rates necessary for maximum economic utilization of the adsorptive properties of the carbon and to examine the feasibility of regenerating the carbon for reuse by thermal reactivation or an alternative procedure. To eliminate the concentration and composition variables encountered in a real sewage effluent and because ABS was believed to by typical of the refractory organics likely to interfere with the regeneration of the spent carbon, a solution of ABS in water was selected as the effluent for the first phase of the program. In the second phase of the program a column test was made on the effluent from a secondary sewage treatment plant.

PB-217 191
San Diego County Public Health Lab., Calif.
QUANTITATIVE VIROLOGIC STUDIES OF SEWAGE.
Progress rept. no. 2, Oct-31 Dec 67,
Raymond E. Leach, and Beatrice England. 25 Jan 68, 11p
Grant FWPCA-WP-01198-01

Descriptors: (*Sewage, *Viruses).

The report describes progress in a study of the quantitation of the major virus groups present in sewage. Experiments have been directed toward selection of an applicable method of assay and concentration of viral content. Results of preliminary tests are presented.

PB-217 192
Communicable Disease Center, Atlanta, Ga.
LICE OF PUBLIC HEALTH IMPORTANCE AND THEIR CONTROL.
Insect control series training guide,
Harry D. Pratt, and Kent S. Littig. 1961, 20p PHS-Pub-772-ICS-8

Descriptors: (*Lice, *Disease vectors), (*Infectious diseases, Lice), (*Public health, Lice), Entomology, Typhus, Rickettsia prowazekii, Rickettsial diseases, Anatomy, Physiology, Life cycles, Animal behavior, Ecology, Insect control, Rats, Parasites.
Identifiers: Blood sucking insects.

Contents:
Lice and history;
Epidemic typhus;
Trench fever;
Relapsing fevers;
General biology of sucking lice;
Biology and habits of the head and body louse;
Biology and habits of the crab louse;
Control of head, body, and crab lice;
How may lice be avoided;
Sucking lice infesting domestic rats.

PB-217 193
Catholic Univ. of America, Washington, D.C. Dept. of Chemical Engineering.
SORPTION BEHAVIOR OF ORGANIC PYROPOLYMERS IN AQUEOUS SOLUTION.
Rept. for 1 Jun 68-30 Apr 69,
Stephen D. Bruck. 1969, 19p
Grant FWPCA-WP-01371-01-A1

Descriptors: (*Carbon, *Adsorptivity), (*Pesticides, *Adsorption), (*Polymers, *Carbonization), Nitrophenols, Pyrolysis, Herbicides.

The sorption behavior of the pyrolysis products (pyropolymers) of organic polymers was investigated. The results indicate that the pyropolymers of poly (vinyl chloride) exhibit selective adsorption towards the herbicide 2-sec-butyl-4,6-dinitrophenol but none to 2,4-dichlorophenoxyacetic acid. The initial rate of adsorption during the first hour is almost twice that of activated carbon with a total uptake of approximately 30% depending on the preparative conditions of the pyropolymers. However, unlike activated carbon, the pyropolymers of poly (vinyl chloride) slowly releases the adsorbate.

PB-217 194
Cornell Univ., Ithaca, N.Y. Dept. of Food Science.
ADAPTATION BY MICROBIAL POPULATIONS.
Progress rept. 1 Sep 67-31 May 68,
Norman C. Dondero, and T. B. S. Prakasam. 1968, 39p
Grant FWPCA-WP-01034-01

Descriptors: (*Sewage treatment, Microbiology), (*Cayuga Lake, *Aquatic microbiology).

In addition to examining the heterotrophs of waste waters and treatment processes, the original objectives of the research project included the examination of natural waters and polluted waters. This report contains material concerned with waste water treatment and with the waters of Cayuga Lake.

PB-217 233
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
UMATILLA RIVER BASIN WATER QUALITY REPORT.
Jul 69, 42p

Descriptors: (*Umatilla River Basin, *Water pollution), (*Oregon, Water pollution).

The Bureau of Reclamation is preparing a comprehensive plan for water resource development of the entire Umatilla Basin. In developing the proposed plan for construction of dams, canals, and other facilities, they have considered all water needs, such as irrigation, municipal and industrial water supplies, fisheries and recreation. The purpose of this investigation was to predict the water quality resulting from project development and to recommend steps to improve water quality where it will not meet requirements. A dissolved oxygen model was developed for the main stem Umatilla River from Ryan Reservoir to the mouth. Predictions of dissolved oxygen levels were prepared for the time horizons of 1980, 2000, and 2020. Conditions with and without the project were modeled.

PB-217 234
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
WATER QUALITY CONTROL STUDY LOMPOC PROJECT, SANTA BARBARA COUNTY, CALIFORNIA.
Jul 67, 38p

Descriptors: (*Santa Ynez River, *Reservoirs), (*California, *Water resources), Forecasting.
Identifiers: *Santa Barbara County (California).

The purpose of the report is to describe the need for and value of reservoir storage for streamflow regulation for water quality control; and the potential impact of the project on water quality. The study is limited to the drainage area of the Santa Ynez River downstream from the proposed project reservoir and the reservoir itself. The study period 1970 to 2020 is considered. (Author)

PB-217 235
Public Health Service, Denver, Colo. South Platte River Basin Project.
MUNICIPAL WASTE REPORT METROPOLITAN DENVER AREA SOUTH PLATTE RIVER BASIN. APPENDIX B.

Dec 65, 122p PR-3

Descriptors: (*Sewage treatment, *Colorado), (*Platte River Basin, Sewage treatment), Inventories.
Identifiers: *Denver (Colorado).

The appendix contains individual reports for all municipal sewage treatment plants investigated in conjunction with the Municipal Waste Study in the Denver Metropolitan area of the South Platte River Basin in 1964. Each plant report consists of a discussion, evaluation and flow diagram of treatment facilities. A record of sampling data and a bar graph of plant performance is included for those plants at which Project sampling studies were conducted.

PB-217 236
Federal Water Pollution Control Administration, Portland Oreg. Northwest Region.
POLLUTIONAL EFFECTS OF PULP AND PAPER MILL WASTES IN PUGET SOUND.

Mar 67, 487p
Report on Studies Conducted by the Washington State Enforcement Project.

Descriptors: (*Puget Sound, *Water pollution), (*Paper industry, Water pollution), (*Washington (State), Water pollution), Industrial wastes, Chemical composition.

Investigations were conducted in four parts of the Sound and is primarily concerned with the pollutional effects of wastes discharged by seven pulp and paper mills. These study areas are Bellingham, Anacortes, Everett, and Port Angeles. Each of these mills discharges untreated or partially treated process wastes into estuarine waters. The objectives of the Project were to determine the effects of these wastes on water quality and marine life, to delineate their interferences with legitimate

water uses, and to ascertain pollution abatement needs. The study was begun in April 1962 and was completed in June 1966.

PB-217 237
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
PUBLIC SEWAGE TREATMENT PLANT CONSTRUCTION.
1956, 17p PHS-Pub-549

Descriptors: (*Sewage treatment, *Contracts), Inventories, Construction.
Identifiers: *Sewage treatment plants.

The report covers contracts awarded in 1956, construction by drainage basin, construction contract awards by population groups, contract awards by size of contract, and construction record 1948-1956.

PB-217 238
Clarkson Coll. of Technology, Potsdam, N.Y.
WORKSHOP SEMINAR ON COAGULATION AND FLOCCULATION (2ND).

21 Jul 67, 10p
Grant PHS-WP-01131-01

Descriptors: (*Flocculating, Meetings), (*Coagulation, Meetings).

The report briefly summarizes a workshop seminar whose aim was to bring together specialists from several disciplines who are active in the study of various aspects of coagulation and flocculation phenomena. Subjects discussed were: Experimental techniques and turbidity standards, Coagulation and flocculation: Physical aspects; Coagulation and flocculation: Chemical aspects; Mutual coagulation; Coagulation and flotation.

PB-217 239
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY NAVASOTA RIVER WATERSHED LOWER BRAZOS RIVER SYSTEM, TEXAS. STUDY OF NEEDS AND VALUE OF STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL.
Jun 65, 81p
Prepared in cooperation with Army Engineer District, Fort Worth, Tex.

Descriptors: (*Brazos River Basin, *Reservoirs), (*Texas, *Water resources), (*Navasota River, *Reservoirs), Forecasting.

The purpose of the study is to estimate the water requirements for municipal, industrial, and water quality control purposes to the year 2075 in the lower Brazos River basin, which includes the Navasota River watershed. Estimates are made of the value of benefits attributable to the storage of water for these purposes in the Federally proposed Navasota River reservoir projects. (Author)

PB-217 240
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY CONTROL AND MANAGEMENT, SNAKE RIVER BASIN.
Sep 68, 76p

Descriptors: (*Snake River Basin, *Water pollution), (*Washington (State), Water pollution), (*Oregon, Water pollution), (*Idaho, Water pollution).

The report summarizes the findings of studies which have provided the impetus to Federal-State water pollution control planning in the Snake River Basin since 1962. It tells where pollution exists, why it exists, what corrective action has already been initiated, and what further steps must be taken to preserve and enhance the quality of water resources of the basin.

PB-217 241
Public Health Service, San Francisco, Calif. Region IX.
SAN JOAQUIN VALLEY AND SACRAMENTO--SAN JOAQUIN DELTA, CALIFORNIA. A PRELIMINARY EVALUATION OF STREAM FLOW REQUIREMENTS FOR WATER QUALITY CONTROL.
Summary rept.
Jun 63, 42p

Descriptors: (*San Joaquin River Basin, *Reservoirs), (*Sacramento River Basins, *Reservoirs), (*California, *Water resources), Forecasting.

The purpose of the report is to provide information on the need for and value of storage in federal reservoirs for the purpose of regulating stream flow for water quality control in selected rivers and the Delta region of the San Joaquin and Sacramento River Basins and to provide information and Public Health Service views regarding the disposal of agricultural drainage from the Federal - State San Luis Project. (Author)

PB-217 242
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, PAT MAYSE RESERVOIR, SANDERS CREEK, TEXAS. STUDY OF NEEDS AND VALUE OF STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL.
Mar 65, 30p
Prepared in cooperation with Army Engineer District, Tulsa Okla.

Descriptors: (*Pat Mayse Reservoir, Water resources), (*Texas, *Water resources), (*Sanders Creek, *Reservoirs), Forecasting.

The purpose of this study was to determine water requirements to the year 2020 and 2070 for municipal, industrial, and water quality control purposes for the area adjoining Pat Mayse Reservoir located on Sanders Creek in northeast Texas, and how these needs may be met. The projected economic developments and anticipated needs for water supply are extended to the year 2070.

PB-217 243
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, PLAQUEMINE LOCK, LOUISIANA. STUDY OF NEEDS AND VALUE OF STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL.
Jun 65, 42p
Prepared in cooperation with Army Engineer District, New Orleans, Louisiana.

Descriptors: (*Mississippi River, *Water resources), (*Louisiana, *Water resources), Forecasting.
Identifiers: Intercoastal waterway.

The purpose of the study is the determination of the need for and value of diversion of water from the Mississippi River to the Intracoastal Waterway, Port Allen to Morgan City Route, with special emphasis on the needs for municipal, industrial, and pollution control purposes through the year 2020 in the three southernmost parishes located between Bayou Lafourche and the East Atchafalaya basin protection levee, together with Morgan City, Louisiana. (Author)

PB-217 244
Quad-City Solid Wastes Committee, Paterson, N.J.
QUAD-CITY REGIONAL SOLID WASTE PROGRAM.
Annual rept. no. 1, 1 Jun 66-31 May 67,
William T. Ingram, and Frank P. Francia. 1968, 177p
Grant PHS-UI-00026

Descriptors: (*New Jersey, *Waste disposal), (*Regional planning, Waste disposal).
Identifiers: *Solid waste disposal, *Clifton (New Jersey), *Passaic (New Jersey), *Paterson (New Jersey), *Wayne (New Jersey).

In the first year of operations under this project much has been accomplished in line with the broad objectives: To evaluate, develop, and demonstrate practices involving a combination of municipalities having a common problem of solid wastes handling; To establish the means for administering and operating a regionalized disposal system; To correlate a regional program with a state program and provide basic data to the State Health Department in furtherance of its long range solid waste disposal planning; To construct and demonstrate a pilot operation selected as best for the region; To encourage regional solid waste handling for all urban area of Passaic County through demonstration of a program applicable to four major municipalities of the County. The Quad-City region comprises of the cities of Clifton, Passaic, and Paterson and the Town of Wayne, New Jersey. These objectives are discussed.

PB-217 245
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
EFFECTS OF THERMAL STRATIFICATION UPON OXYGEN RESOURCES, JOHN H. KERR RESERVOIR.
Interim rept.,
C. Robert Horn, and Russel H. Wyer. Jun 68, 27p
Technical paper-TS-1

Descriptors: (*Roanoke River, *Reservoirs), (*Stratification, *John H. Kerr Reservoir), (*Virginia, *Water pollution), Dissolved gases, Oxygen, Temperature gradients.
Identifiers: *Reservoir releases.

The objectives of the study were to determine the effects of releases from the John H. Kerr Reservoir upon downstream water quality, define the stratification characteristics of the reservoir, determine power discharge relationships to dissolved oxygen in the trailrace, and establish a water quality basis for evaluating the effectiveness of pilot control devices for improving the quality of water released from the reservoir.

PB-217 246
Federal Water Quality Administration, Washington, D.C.
FEDERAL WATER QUALITY ADMINISTRATION BRIEFING BOOK.
Clean water rept.

Dec 70, 208p

Descriptors: (*Government policies, *Water resources), National government.
Identifiers: Government agencies, *Federal Water Quality Administration.

The Federal Water Quality Administration derives it basic statutory authority from the Federal Water Pollution Control Act, as amended. Details of the Agency are given in the following Sections of this document. The contents include: Mission, authorities and legislative proposals; Strategy and goals; Major programs; Summary of legal actions; Status of water quality standards; Organization; Key personnel; President's Water Pollution Control Advisory Board; and Resources.

PB-217 247
Southeastern Radiological Health Lab., Montgomery, Ala.

LABORATORY EXAMINATION OF A RUPTURED 50-MG RADIUM SOURCE.
Technical rept.,
P. H. Bedrosian, and G. L. Gels. May 70, 20p
BRH-SERHL-70-1

Descriptors: (*Radium, *Leak tests), (*Radiation hazards, Leak tests).

A procedure for safely handling a ruptured radium source is described. The technique employed was designed to prevent leakage of radium to the environment and also to minimize radiation exposures to personnel. A photographic leak-test method developed at the Southeastern Radiological Health Laboratory, Bureau of Radiological Health, was also tested with the ruptured source. Measurements and photographic evaluation of the rupture and assessment of radium losses from the source are documented. (Author)

PB-217 248
Public Health Service, New York, Region II.
PUBLIC MEETING ON WASTE DISPOSAL IN THE NEW YORK BIGHT. THURSDAY, OCTOBER 16, 1958.
1958, 100p

Descriptors: (*Waste disposal, New York Bight), (*Water pollution, *New York Bight), Atlantic Ocean, Proceedings.
Identifiers: *Ocean waste disposal.

The public meeting was in response to complaints from the Commissioner of Health, the Govenors office, and the Sportsmen's Council relative to dumping operations beyond the State boundaries, but in waters subject to Federal Jurisdiction.

PB-217 249
Public Health Service, San Francisco, Calif. Region IX.
WATER SUPPLY AND WATER QUALITY STUDY PAJARO RIVER BASIN CALIFORNIA. PRELIMINARY REPORT ON FUTURE MUNICIPAL AND INDUSTRIAL WATER USE AND WATER QUALITY CONTROL NEEDS.

Apr 64, 64p

Descriptors: (*Pajaro River Basin, *Water resources), (*California, *Water resources), Water consumption, Water pollution, Forecasting.

The study considers the present and projected water quality control needs and water use within the Pajaro River Basin. Projections developed from a Corps of Engineers Economic Base Study, are made by 20 year increments to the year 2060. Pollution loads to the stream and/or alternate means of waste disposal are considered in order to determine the extent of water quality management required. Alternate methods of providing municipal and industrial water needs are investigated. This study is based on a review and interpretation of available data and reports and limited visual field observations.

PB-217 250
Communicable Disease Center, Atlanta, Ga.
INSECTICIDAL EQUIPMENT FOR THE CONTROL OF INSECTS OF PUBLIC HEALTH IMPORTANCE. TRAINING GUIDE - INSECT CONTROL SERIES.
1960, 33p PHS-Pub-774

Descriptors: (*Insect control, Equipment), Dusting, Sprayers.

The effective use of insecticides is dependent upon the availability of efficient and durable applicators. Many hundreds of sprayers, dusters, fumigators, and other devices have been designed, manufactured, and marketed; yet, equipment available today is generally inefficient and easily damaged. Acutely aware of this, manufactorers are expending great effort in research and development, but efficient applicator equipment remains one of the great unsolved problems of public health engineering. The paper discusses the problem of obtaining efficient applicator equipment. (Author Modified Abstract)

PB-217 251
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT ON POLLUTION OF INTERSTATE WATERS OF THE NORTH PLATTE RIVER TORRINGTON, WYOMING TO BRIDGEPORT, NEBRASKA.
Rept. for Nov-Dec 60.
1961, 37P

Descriptors: (*Platte River Basin, *Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution).
Identifiers: *Water quality data.

The purposes of the investigation were to determine the extent and types of pollution, to review existing laws, to evaluate the sanitary quality of irrigation waters, to make recommendations regarding minimum stream flows, to evaluate sanitary quality of water for municipal requirements and other public uses, to estimate possible benefits of reservoir releases in improving water quality, and to make recommendations for pollution abatement.

PB-217 252
Massachusetts Univ., Amherst. Dept. of Civil Engineering.
DEWATERING OF BENTHIC DEPOSITS ON SOILS.
Donald Dean Adrian, John H. Nebiker, and T. H. Feng. 1968, 30p
Grants NSF-GK-924, FWPCA-WP-01239

Descriptors: (*Spoil, *Dewatering), (*Dredging, Waste disposal), (*Waste disposal, Spoil), Theories, Mathematical models.
Identifiers: *Solid waste disposal.

Benthic deposits in our nation's rivers, lakes, reservoirs, and estuaries are producing very difficult problems of pollution including eutrophication. The only solution for the majority of the problems is the removal of these deposits. However, this does not represent a final solution. Disposal of the voluminous dredgings may result in surface and ground water pollution at the disposal site. Such pollution can be controlled by dewatering the deposits prior to final disposal. Gravity dewatering of these highly organic, compressible materials on prepared soils appears practicable. The authors have made a theoretical analysis of gravity dewatering of dredging slurries and dilute organic suspensions. A three-parameter equation was developed relating dewatering rate to the solids content, specific resistance, and compressibility coefficient of the suspensions. It is felt that a rational basis for design and operation of dredging dewatering sites now exists. (Author Modified Abstract)

PB-217 253
Public Health Service, Dallas, Texas. Region VII.
WATER RESOURCES CONFERENCE WORKBOOK.

May 61, 161p

Descriptors: (*Water resources, *Meetings), Forecasting.

The report contains papers presented at a conference on general water resources in the United States. The Papers discussed topics such as resources planning, water management, population forecasting, water pollution, and pollution abatement.

PB-217 254
Public Health Service, Washington, D.C.
SORPTION AND MOVEMENT OF POLLUTED WATER IN SOIL.
Appendices,
J. W. Biggar, and R. L. Riggs. 1973, 291p
Grant FWPCA-WP-0081-06

Descriptors: (*Soil properties, *Insecticides), Adsorption, Dieldrin, Kaolinite, DDT, Insecticides, Chlorine organic compounds, Water pollution, Ground water.
Identifiers: *Path of pollutants, *Lindane.

The report consists of several appendices, each of which is a study of the adsorptive behavior of various insecticides in solution on soils.

PB-217 255
Texas Univ., Austin. Center for Research in Water Resources.
UPTAKE AND UTILIZATION OF AMINO ACIDS DURING ANAEROBIC DIGESTION.
Final rept. 1 Oct 64-30 Sep 65,
Ernest M. Miholits, and Joseph F. Malina, Jr. Nov 65, 210p CRWR-11, EHE-11-6505 WP-83
Grant FWPCA-WP-00083-03

Descriptors: (*Anaerobic processes, *Metabolism), (*Sludge digestion, *Amino acids), Tracer studies, Fermentation.
Identifiers: *Methane bacteria.

The report represents a detailed study of the effects of amino acids on the anaerobic sludge digestion process and the effects of the anaerobic environment on the degradation of five selected amino acids. Radiotracer techniques permitted a detailed assay of the distribution of the individual amino acids in the liquid, solid, and gaseous phases. The control of the amino acid concentration in plant-scale anaerobic digestions systems may lead to a more efficient operation and increased gas production. The purpose of the report is to serve as the basis for a more extensive evaluation of the role of amino acids during anaerobic digestion and for the establishment of the relationships of amino acids to the effective stabilization of wastewater solids. (Author Modified Abstract)

PB-217 256
Federal Water Pollution Control Administration, Cincinnati, Ohio. Div. of Pollution Surveillance.
A PROGRAM GUIDE TO AUTOMATED INSTRUMENTATION FOR WATER POLLUTION SURVEILLANCE.

Oct 66, 23p

Descriptors: (*Water pollution, *Monitors), Automation, Instruments.
Identifiers: *Water pollution sampling, Water pollution detection.

Contents:
Development and use of instrumentation;
Selection of parameters and output;
Determination of amount and accuracy of data;
Types of instrumentation;
Expandable integrated data acquisition system;
Planning a sampling facility;
Calibration, Operation, and Maintenance;
Handling, Automatic Processing, and Evaluation of Data;
Instrumentation costs;
References.

PB-217 257
Public Health Service, Denver, Colo. Region VIII.
ANNOTATED BIBLIOGRAPHY ON THE EFFECTS OF IRRIGATION PRACTICES ON STREAM WATER QUALITY WITH EMPHASIS ON SALINITY AND PESTICIDES.

Nov 63, 42p PR-12

Report on Colorado River Basin Water Quality Control Project.

Descriptors: (*Irrigation, *Water pollution), (*Bibliographies, Water pollution), Pesticides, Minerals, Salt water.
Identifiers: *Return flow.

The bibliography provides information of a general nature concerning the mechanics, variables, and effects of the introduction of saline materials stemming from agricultural activities into receiving waters. The references have been compiled from a variety of sources including periodicals, published abstracts, and government and university publications.

PB-217 258
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
LAKE ERIE SOUTH SHORE TRIBUTARY LOADING DATA SUMMARY, 1967.

Aug 68, 32p

Descriptors: (*Lake Erie, *Water pollution), Solids, Chlorides, Nutrients.

The 1967-68 survey determined total solids, chloride, and total phosphorus loadings from thirteen south shore tributaries to Lake Erie. The data show that large quantities of solids and nutrients from basin tributaries are being discharged to Lake Erie. (Author Modified Abstract)

PB-217 259
Southwestern Radiological Health Lab., Las Vegas, Nev.
A KRYPTON-83M GENERATOR,
A. A. Moghissi, and H. B. Huff. 13 Aug 70, 3p
Prepared in cooperation with Oak Ridge National Lab., Tenn. Pub. in International Jnl. of Applied Radiation and Isotopes, v22 p218-220 1971.

Descriptors: (*Krypton 83, Production), (*Radioactive isotopes, Production).

Krypton-83m has several useful applications. It can be used to follow the separation of (85)Kr from air for surveillance purposes and it is potentially attractive for studies of pulmonary function. Although several methods for the production of (83m)Kr have been proposed, no generator for laboratory use has been reported. A convenient method of producing such a generator seems to be by means of (83)Rb which decays with an abundance of 77 per cent to (83m)Kr. For the purpose of (83m)Kr production, the purity of (83)Rb is irrelevant and the presence of (84)Rb commonly accompanying (83)Rb poses no problem. With a half life of 83 days (83)Rb is well suited for laboratory use. The report presents a description of a (83)Rb (83m)Kr generator. (Author Modified Abstract)

PB-217 260
Sacramento County Dept. of Public Works, Calif. Utilities Div.
PRIMARY TREATMENT AND SLUDGE DEWATERING BY VIBRATING SCREENS.
Progress rept. 1 Jun 67-31 May 68,
William C. Wanderer, Jr. 29 Apr 68, 5p
Grant WPD-177-01

Descriptors: (*Sewage filtration, *Vibrating screens), (*Sewage treatment, Sewage filtration), Dewatering.

The objectives of the report are to demonstrate the feasibility of using vibrating screens to separate solids from waste water and to thicken raw sludge. (Author Modified Abstract)

PB-217 262
Public Health Service, Kansas City, Mo. Region VI.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, NEMAHA RIVER BASIN (KANSAS AND NEBRASKA).
Jun 64, 47p

Descriptors: (*Nemha River Basin, *Reservoirs), (*Kansas, *Water resources), (*Nebraska, *Water resources).

The study determines the need for and value of storage for municipal and industrial water supply and quality control in the Nemaha River Basin which is 1920 square miles and is located in southeast Nebraska and northeast Kansas. The study covers water storage needs and values during the 100-year study period, 1960 to 2060, as requested by the Corps of Engineers.

PB-217 263
Communicable Disease Center, Atlanta, Ga.
MOSQUITOES OF PUBLIC HEALTH IMPORTANCE AND THEIR CONTROL.
Insect control series,
Harry D. Pratt, Ralph C. Barnes, and Kent S. Littig. May 63, 69p PHS-Pub-772-ICS-6

Descriptors: (*Culicidae, *Insect control), Disease vectors, Public health.

Because mosquitoes play an important role in the transmission of encephalitis, and cause great discomfort and misery by their bites, there has been a great expansion recently in mosquito control activities. In this training guide the importance of mosquitoes to human health will be considered as well as their biology, habits, identification and control. Survey and evaluation measures are also discussed, as well as training aids for supporting a program. (Author Modified Abstract)

PB-217 264
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
A DISCUSSION AND TABULATION OF DIFFUSION COEFFICIENTS FOR TIDAL WATERS COMPUTED AS A FUNCTION OF VELOCITY.
Feb 67, 49p CB-SRBP-Technical Paper-9

Descriptors: (*Tidewater, *Diffusion coefficients), Tables (Data).

The diffusion coefficients presented in this tabulation have been computed for a velocity range from 0.01 knots to 5.00 knots at an interval of 0.01 knot. The equations employed for the computation were derived from the FOUR-THIRDS law and the RANDOM PROCESS analogy equations. A difference function and mean value function are also tabulated. (Author)

PB-217 265
Massachusetts Univ., Amherst. School of Engineering.
LABORATORY FACILITIES FOR FLOW IN POROUS MEDIA RESEARCH,
Donald Dean Adrian. 1967, 12p
Presented at the Internal Symposium on Fluid Dynamics (1st), Amherst, Mass., 1-2 Dec 67.

Descriptors: (*Soil properties, *Percolation), (*Sludge dewatering, Research).

An enhanced engineering research program at the University of Massachusetts will bring about greater stresses on research facilities with which to study fluid flow through porous media. The paper provides a discussion of a few areas for such research and the facilities which would be utilized in conducting an active research program. The types of research discussed are of particular interest in water resources and environmental engineering. (Author)

PB-217 266
Illinois Univ., Urbana. Dept. of Civil Engineering.
MECHANISMS OF SLUDGE THICKENING,
R. I. Dick. 28 May 68, 4p
Grant PHS-WP-01011-03

Descriptors: (*Sludge dewatering, Thickening).
Identifiers: *Sludge treatment.

Emphasis has been directed toward study of the basic mechanisms involved in sludge thickening and the feasibility of altering, or taking advantage of, the basic properties of suspensions to improve their thickening characteristics. This work is very briefly reviewed.

PB-217 267
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
POLLUTION OF THE UPPER MISSISSIPPI RIVER AND MAJOR TRIBUTARIES.

Jul 66, 525p
Report on Twin Cities-Upper Mississippi River Project.

Descriptors: (*Mississippi River Basin, *Water pollution), Regulations, Water consumption, Sources.

The report determines the extent of pollution in the rivers of the study area. The study area extends on the Mississippi River for 107 miles between its confluences with the Rum and Chippewa Rivers, on the Minnesota River from its mouth upstream 110 miles to Mankato, Minnesota, and on the St. Croix River from its mouth 55 miles upstream to Taylors Falls, Minnesota. It also investigates the principal sources of pollution and contributions from these sources, determines the effect of pollution on the numerous water uses, and develops programs for the achievement of various water uses on rivers of the study area.

PB-217 269
Public Health Service, Washington, D.C.
ORDINANCE AND CODE REGULATING EATING AND DRINKING ESTABLISHMENTS RECOMMENDED BY THE U. S. PUBLIC HEALTH SERVICE.
Jun 40, 37p

Descriptors: (*Food services, Regulations), (*Food sanitation, Regulations), National government.
Identifiers: *Restaurants.

The report contains the ordinance and code regulating eating and drinking establishments which is recommended by the U. S. Public Health Service for adoption by States, municipalities, and health districts in order to encourage a greater uniformity and a higher level of excellence in the sanitary control of eating and drinking establishments. (Author Modified Abstract)

PB-217 270
Iowa Engineering Experiment Station, Ames.
DESIGN REQUIREMENTS FOR MUNICIPAL DIATOMITE FILTERS.
Progress rept. no. 2, 1 Jul 62-29 Feb 64,
Paul E. Morgan, and E. Robert Baumann. 30 Apr 64, 188p
Grant PHS-WP-00196
See also Progress rept. no. 3, dated 15 Dec 65, PB-217 676.

Descriptors: (*Diatomaceous earth, *Filter aids), (*Sewage filtration, Filter aids), (*Filtration, Filter aids), Sand filtration.

The report describes progress made toward developing an optimum diatomite filter design for municipal water treatment plants. Individual research projects relative to this optimization program are delineated.

PB-217 272
Public Health Service, Portland, Oreg. Region IX.

HYDROLOGIC COMPUTATIONS FOR RIVER BASIN STUDIES. STANDARD FOR HYDROLOGIC ANALYSIS PROCEDURES,
Frank H. Rainwater. Dec 64, 19p Working Paper-51
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*River basins, *Hydrology), Stream flow.

The purpose of the paper is to describe a procedure for the hydrologic computations necessary to river basin studies. For this paper hydrology is defined as the science dealing with water, its properties, phenomena and distribution, especially with reference to water on the surface of the land, in the soil and underlying rock, and in the atmosphere. This definition implies that quantity and quality are hydrologic factors that are inseparable for a complete analysis of existing data. However, it is proposed herein to separate the computations by obtaining and analyzing data on quantities of flow, and later superimposing quality data upon the quantity analysis to determine flow and storage needs for water quality control. (Author Modified Abstract)

PB-217 273
Federal Water Quality Administration, Manassas, Va. Advanced Waste Treatment Research Lab.
MIXED LIQUOR SOLIDS SEPARATION BY FLOTATION,
Michael C. Mulbarger, and Donald D. Huffman. 10 Dec 69, 11p
Contract FWPCA-WA-66-19
Pub. in Jnl. of the Sanitary Engineering Division, Proceedings of the American Society of Civil Engineers, v96 nSA4 p861-871 Aug 70.

Descriptors: (*Sewage treatment, *Flotation), Performance evaluation, Cost comparisons, Solids.

The first full-scale application of dissolved air flotation for mixed liquor solids separation has been incorporated at a new 1.0 mgd Water Pollution Control Facility in Prince William County, Virginia. The results of a field investigation at this facility are reported herein. The data indicate that conventional design criteria do not fully characterize flotation performance, and a new parameter, developed from a theoretical relationship derived by Howe is offered as a rational design and operational guideline. Flotation performance is analyzed in terms of float detention time and process design. Cost-quality comparisons of mixed liquor solids separation by flotation and gravity sedimentation are presented. (Author)

PB-217 274
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BIOLOGICAL ANALYSIS OF WATER POLLUTION IN NORTH AMERICA,
A. F. Bartsch, and William M. Ingram. 1966, 16p
Pub. in Verh. Internat. Verein. Limnol., v16 p786-800 Dec 66. (Stuttgart).

Descriptors: (*Water pollution, *Aquatic biology), (*Ecology, Water pollution), Indicator species.

The two examples given emphasize that North American biologists engaged in water pollution control activities increasingly focus their skills and energy on extraordinary problems. In doing so, they utilize the saprobic system, parts of it or derivations from it, as long as the system contributes to problem solution. At present, however, most North American pollution problems are not solved by use of the saprobic system.

PB-217 275
Environmental Health Center, Cincinnati, Ohio.
OUR PRIMARY CONCERN - THE STREAM,
V. G. MacKenzie. 1953, 9p
Presented at the Pennsylvania Clean Streams Conference (2nd), Harrisburgh, Pa., 20 Nov. 53.

Descriptors: (*Water resources, *Conservation), (*Water pollution, Water resources).

In summary, there is presented as a rational basis for water pollution control the 'total use' concept in which all legitimate water uses receive recognition in an integrated totality with each use accorded its proper emphasis in the public interest. The use of this concept requires a primary emphasis on the stream itself and it would appear that the technical questions involved insofar as industrial wastes are concerned, can best be resolved by an active and understanding cooperation between industry and control agencies. (Author)

PB-217 276
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SEPTIC TANK DESIGN ECONOMIC FACTORS INVOLVED,
James B. Coulter. 1955, 20p
Presented at the Home Sewage Disposal Training Conference at Michigan State College, East Lansing, Mich., 11 Jan 55.

Descriptors: (*Septic tanks, Design).

In light of present knowledge, the idea should be discarded that there is a single best design for a septic tank. Acceptable performance can be obtained with a wide range of freedom in design. The report reviews the current design status.

PB-217 277
Public Health Service, Cincinnati, Ohio.
THE DETERMINATION OF OXYGEN CONSUMED,
W. Allan Moore. 20p

Descriptors: (*Oxygen, *Water analysis), (*Water pollution, Water analysis).
Identifiers: *Water pollution detection, *Chemical oxygen demand.

A chemical method has been sought for the estimation of the strength of waste products of either human or industrial origin; but because of the complexity of various samples of wastes, the metabolic activities of the flora and fauna present do not necessarily follow a constant rate. Therefore a chemical method could not correlate with the biochemical determination of oxygen demand. However, it is often desirable to know in a minimum time the approximate oxygen absorbing power of a waste sample so a chemical oxygen consumed method is satisfactory for this purpose. The report compares the various methods used in this determination.

PB-217 278
Environmental Health Center, Oak Ridge, Tenn.
SOME OBSERVATIONS ON THE REMOVAL OF RADIOACTIVE MATERIALS FROM WASTE SOLUTIONS,
Conrad P. Straub. 1950, 17p

Descriptors: (*Radioactive waste processing, *Dewatering).

Many of the methods available for use in the treatment of industrial wastes may be utilized in the treatment of radioactive wastes; however, it must be remembered that, just as in sewage and industrial waste treatment, separation of the wastes into their liquid and solid fraction and discharge of the inocuous fraction does not solve the problem. The residue remains for disposal. All that can be accomplished is to concentrate the radioactive fraction into a smaller volume to permit disposal either as a sludge or slurry. The report discusses this. Where incineration is possible, providing precautions are taken to prevent contamination by volatile gases or fly ash, further concentration or reduction in volume may be obtained. Care must be given also to the removal of the resultant ash. The reduced volume of solid material then may be placed in suitable containers and buried in controlled areas or stored for decay or future recovery.

PB-217 279
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SEWAGE AND WATER WORKS CONSTRUCTION,
Richard S. Green, Donald A. E. Beer, and Elsie M. Gibson. 1960, 17p PHS-Pub-758-Rev-60

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), Inventories.
Identifiers: *Sewage treatment plants.

The contract award data presented in this publication for the year 1959 result from the careful examination of over 25,000 contract notifications in the sewage and water works construction and related fields. All notifications of similar contracts awarded in the same geographical area are checked to reduce the chance of duplication. Certain contracts, primarily those covering sewage treatment plants, are checked and verified by the various State water pollution control agencies. (Author Modified Abstract)

PB-217 280
Public Health Service, Washington, D.C.
TENDENCIES IN STANDARDS OF RIVER AND LAKE CLEANLINESS,
H. W. Streeter. 13 Jun 34, 13p
Presented at the Meeting of the Illinois Association of Sanitary District Trustees, Waukegan, Ill., 13 June 34.

Descriptors: (*Water pollution, Standards).
Identifiers: *Water pollution standards.

The report provides a brief overview of the history, present status, and future trends in the development of water quality standards.

PB-217 281
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
DESIGN OF AMMONIA STRIPPING TOWERS FOR WASTEWATER TREATMENT,
Robert Smith. Aug 70, 12p

Descriptors: (*Sewage treatment, *Ammonia), (*Industrial waste treatment, *Ammonia), Design criteria.
Identifiers: *Ammonia stripping.

Ammonia stripping towers which are similar in construction to cooling towers are believed to be an effective process for removing ammonia nitrogen from domestic and industrial wastewater. The report briefly describes the design criteria of this operation as based upon a computer program.

PB-217 282
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
A NATIONAL PROGRAM FOR WATER POLLUTION CONTROL. CONSIDERATION OF SOME ELEMENTS IN ITS FORMULATION AND ADMINISTRATION,
J. K. Hoskins. 1973, 18p
Presented before meetings of New Jersey Sewage Works Association, Trenton, N. J., 21-22 Mar 35.

Descriptors: (*Water pollution, Regional planning).

The report makes estimates of the extent of the water pollution problem caused by municipalities and industries. It then presents suggestions for the formulation of a national program for the abatement of the problem and the rehabilitation of the country's water resources.

PB-217 283
Federal Water Pollution Control Administration Metuchen, N.J. Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project.
POLLUTION OF THE NAVIGABLE WATERS OF MORICHES BAY AND EASTERN SECTION OF GREAT SOUTH BAY.
Sep 66, 62p
Errata sheet inserted.

Descriptors: (*Moriches Bay, *Water pollution), (*Long Island, Water pollution), (*New York, Water pollution), Great South Bay.

The navigable waters of Moriches Bay on Long Island and the easterly end of Great South Bay receive the discharge of wastes from extensive duck farms, municipal and domestic sewerage systems, industrial operations, recreational boats, and land drainage. As a result, these waters are polluted by bacteria, suspended solids, and nutrients. The report discusses the problems associated with pollution abatement.

PB-217 284
Edison Water Quality Lab., N.J.
STORM AND COMBINED SEWER POLLUTION CONTROL PROGRAM.
Progress rept.
Sep 70, 54p
Grant FWPCA-WP-0243

Descriptors: (*Combined sewers, Overflows), (*Storm sewers, Overflows), (*Water pollution, *Overflows), Research.
Identifiers: *Water pollution control.

The report provides information on the Storm and Combined Sewer Pollution Control Program at Edison, N.J. and Washington, D.C. which falls into the three PPBS categories: 1102 - Combined Sewer Overflows; 1103 - Storm Water Discharges; and 1104 - Non-Sewered Runoff. The Edison activities up to the present time have consisted of technical support given to Headquarters, coordination and management of the Federally-financed extramural program, initiation of various State-of-the-Art reports, planning for in-house research, and special consultation when indicated. (Author Modified Abstract)

PB-217 285
Public Health Service, Cincinnati, Ohio.
OHIO RIVER POLLUTION SURVEY. VOLUME III. MAJOR TRIBUTARY BASINS.
Final rept.

1942, 842P

Descriptors: (*Ohio River Basin, *Water pollution), Scioto River Basin, Miami River Basin, Kentucky River Basin, Licking River Basin, Salt River Basin, Wabash River Basin, Cumberland River Basin, Green River Basin, Tennessee River Basin.
Identifiers: *Water quality data.

The basic information of the Ohio River Pollution Survey is presented in summaries covering the main Ohio River. Insofar as possible, information for each major tributary basin is preseted in as near identical form as possible, according to the following general outline: Syllabus and conclusions; Description; Presentation of field data; Presentation of laboratory data; Hydrometric data; Discussion. The basins discussed are: Scioto River Basin; Miami River Basin; Little Miami River Basin; Kentucky River Basin; Licking River Basin; Salt River Basin; Wabash River Basin; Cumberland River Basin; Green River Basin; Tennessee River Basin.

PB-217 286
Environmental Protection Agency, Washington, D.C.
WASTEWATER PURIFICATION AT LAKE TAHOE.

1973, 8p

Descriptors: (*Sewage treatment, *Water reclamation), (*Lake Tahoe, Sewage treatment).
Identifiers: *Tertiary sewage treatment.

Describes a water purification plant and reclamation processes at Lake Tahoe. Topics include nitrogen removal, mixed media filtration, polishing on activated carbon, solids disposal and materials recovery, and plant performance.

PB-217 287
Federal Water Quality Administration, Fort Lauderdale, Fla. Lower Florida Estuary Study.
POLLUTION OF THE WATERS OF DADE COUNTY, FLORIDA.

1970, 104p

Descriptors: (*Florida, *Water pollution), Sources.
Identifiers: *Dade County (Florida), Water pollution abatement, *Water quality data.

The report discusses the effects on water quality of the numerous waste sources discharging into the canals, coastal waters and ocean in and adjacent to Dade County. The necessary actions required to alleviate the problem are also discussed. (Author)

PB-217 288
Environmental Health Center, Cincinnati, Ohio.
MISSOURI RIVER BASIN PLANKTON STUDY: REPORT OF THE PLANKTON SURVEY MADE IN THE MISSOURI RIVER BASIN DURING JULY, AUGUST, AND EPTEMBER 1950,
Kenneth E. Damann. Aug 51, 112p
Prepared in cooperation with Missouri River Basin Office, Kansas City. Div. of Water Pollution Control.

Descriptors: (*Missouri River Basin, *Plankton), (*Biological surveys, Missouri River Basin).

The prime objectives of the survey were: To determine plankton population in various areas of the Missouri River Basin during the summer months; To learn something of the physical, chemical and biological conditions of importance to plankton production and distribution during this period; To define problem areas; To gain an over-all picture of ecological conditions affecting algal growth in the Basin; and To observe the effects of impoundment upon plankton production whereever reservoirs were already in operation in the Basin. Author Modified Abstract)

PB-217 289
Cincinnati Univ., Ohio.
FOAM FRACTIONATION WITH REFLUX.
Progress rept. 1 Dec 66-15 May 68,
Robert Lemlich. 28 May 68, 182p
Grant PHS-WP-00161

Descriptors: (*Flotation, Performance evaluation), Chemical engineering, Numerical analysis.
Identifiers: *Foam fractionation.

Drainage and coalescence within a vertical foam fractionation column were measured experimentally. This was accomplished by constructing and operating a vertical column equipped with a series of electrical conductivity cells mounted internally at various levels. With these cells, the variation in the local foam density along the column was determined from the variation in the local conductance. The change in bubble size was measured photographically. Other variables were determined by conventional means. The surfactants employed included Triton X-100, albumin, and saponin. Reflux ratios ranged from zero to infinity. Consideration was given to the increased separation attainable by vertically elongating the liquid pool so as to establish a concentration gradient within it. A detailed analysis of this phenomenon was prepared in terms of potential flow and penetration theory at the upstream portion of the bubble, plus a renewing wake downstream and an overall solute balance.

PB-217 290
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, NORTH AND MIDDLE FORK SNOQUALMIE PROJECTS, SNOHOMISH RIVER BASIN, WASHINGTON.

Nov 66, 46p

Descriptors: (*Snoqualmie River Watershed, *Reservoirs), (*Washington (State), *Water resources), Forecasting.
Identifiers: *Seattle (Washington).

An investigation has been made which discloses a need for storage in Snoqualmie River watershed to meet future water demands in the Seattle urban area. A need for storage for water quality control is not foreseen at this time. Future water requirements and quality projections are based on economic, demographic, and engineering studies. (Author)

PB-217 291
Environmental Health Center, Cincinnati, Ohio.
INDUSTRIAL WASTE SURVEY REPORT.
Rept. for 4 May-14 May 53.

1953, 18P
Prepared in cooperation with Firestone Tire and Rubber, Co., Riverview, Mich. Steel Products Div.

Descriptors: (*Water pollution, *Detroit River), (*Michigan, Water pollution), (*Iron and steel industry, Water pollution), Industrial wastes.
Identifiers: *Riverview (Michigan), *Water quality data.

The survey was conducted to determine the characteristics of the process wastes discharged from the Steel Products Division of the Firestone Tire and Rubber Company to the Detroit River. The plant is located in Riverview, Michigan, approximately a half a mile south of the south corporate line of the Village of Wyandotte.

PB-217 292
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NITROGEN REMOVAL BY BREAKPOINT CHLORINATION,
Thomas A. Pressley, Dolloff F. Bishop, and Stephanie G. Roan. Sep 70, 41p
Presented at the National Meeting of American Chemical Society, Chicago, Illinois, September 1970.

Descriptors: (*Sewage treatment, *Nitrification), (*Chemical removal (Sewage treatment), *Ammonia), (*Chlorination, Ammonia).
Identifiers: *Breakpoint chlorination.

Breakpoint chlorination, as practiced for many years in the water treatment industry provides a physical-chemical means for removing ammonia from wastewaters. Chlorine is added to process waters until a point is reached where the total dissolved residual chlorine has reached a minimum (the breakpoint) and the NH3 minus N has disappeared. In this study sodium hypochlorite was used to oxidize the ammonia in buffered distilled water systems and in raw, secondary and lime clarified municipal wastewaters.

PB-217 369
Department of Health, Education and Welfare, Washington, D.C.
PROCEEDINGS OF CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE RED RIVER OF THE NORTH, NORTH DAKOTA-MINNESOTA.

14 Sep 65, 379p
Errata sheet inserted.

Descriptors: (*Red River of the North, *Water pollution), (*North Dakota, Water pollution), (*Minnesota, Water pollution), Proceedings.
Identifiers: *Water quality data.

On the basis of reports, surveys, and studies, the Secretary of Health, Education, and Welfare, having reason to believe that interstate pollution of the Red River of the North and its tributaries, caused by discharges of untreated and inadequately treated sewage and industrial wastes in Minnesota and North Dakota, was endangering health and welfare in both States, called a Conference in the matter of pollution of the interstate waters. The report is a summary of the precedings and discussion at the conference. (Author Modified Abstract)

PB-217 370
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
PRELIMINARY INVESTIGATION OF MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND STREAM QUALITY CONTROL REQUIREMENTS AND BENEFITS ASSOCIATED WITH MULTIPLE-PURPOSE STUDIES OF THE PROPOSED DAYTON RESERVOIR, TOUCHET DIVISION, WALLA WALLA PROJECT, WASHINGTON.

Jan 62, 49p Working Paper-20
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Touchet River Basin, *Reservoirs), (*Washington (State), *Water resources), Forecasting, Dayton Reservoir.
Identifiers: *Columbia County (Washington).

The report represents a preliminary examination of present and future municipal and industrial water supply and stream quality control needs in the Touchet River Basin with particular reference to the feasibility of providing storage and/or flow regulation to serve these needs in the Bureau of Reclamation's proposed Dayton Reservoir of the Touchet Division, Walla Walla Project, Washington. The report identifies uses and sources of water in the proposed project area and describes sources of waste, waste treatment practices and the effect of waste effluents and other materials on the quality of specific reaches of the Touchet River. (Author)

PB-217 371
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
PRELIMINARY INVESTIGATION OF MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND STREAM QUALITY CONTROL REQUIREMENTS AND BENEFITS ASSOCIATED WITH MULTIPLE-PURPOSE STUDIES OF THE PROPOSED MONMOUTH-DALLAS PROJECT, POLK COUNTY, OREGON.

Apr 62, 25p Working Paper-22
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River Basin, *Reservoirs), (*Oregon, *Water resources), Rickreall Creek.
Identifiers: *Polk County (Oregon).

The report represents a preliminary examination of present and future municipal and industrial water supply and stream quality control needs in the Rickreall Creek area of the Willamette River Basin with particular reference to the feasibility of including provisions for satisfying these needs in the Bureau of Reclamation's proposed Monmouth-Dallas Project, Polk County, Oregon. The report identifies uses and sources of water in the project area and describes sources of waste, waste treatment practices and the effects of waste effluents and land drainage materials on the quality of specific reaches of Rickreall Creek. Included also is a preliminary economic evaluation of the area, the findings of which have formed the basis for estimating future municipal and industrial water supply needs and for approximating the effects of future wastes and land uses on stream quality.

PB-217 372
Public Health Service, Washington, D.C.
BIOLOGICAL PRODUCTS. ESTABLISHMENTS LICENSED FOR THE PREPARATION AND SALE OF VIRUSES, SERUMS, TOXINS AND ANALOGOUS PRODUCTS, AND THE TRIVALENT ORGANIC ARSENIC COMPOUNDS.

1 Jan 68, 38p PHS-Pub-50-Rev-68

Descriptors: (*Biological products, *Licenses), Toxins and antitoxins, Blood serums, Viruses, Bacteria, Antigens, Vaccines, Chemical compounds, Blood, Blood banks, Agents, Standards, Public health, Biological laboratories.

There is presented herewith a list of the establishments holding licenses issued in accordance with section 351 of an act of Congress approved July 1, 1944, entitled 'Public Health Service Act' (58 Stat. 682), and a list of the products which each establishment is licensed to manufacture. Section 351 of this act is designed to regulate the sale barter and exchange of viruses, serums, toxins, antitoxins, analogous products, and arsphenamine or its derivatives (or any other trivalent organic arsenic compound) in the District of Columbia, in interstate and foreign commerce, and for other purposes.

PB-217 373
Public Health Service, Washington, D.C.
BIOLOGICAL PRODUCTS. ESTABLISHMENTS LICENSED FOR THE PREPARATION AND SALE OF VIRUSES, SERUMS, TOXINS AND ANALOGOUS PRODUCTS, AND THE TRIVALENT ORGANIC ARSENIC COMPOUNDS.
15 Apr 61, 72p PHS-Pub-50-Rev-61

Descriptors: (*Biological products, *Licenses), Toxins and antitoxins, Blood serums, Immune serums, Viruses, Vaccines, Antigens, Bacteria, Chemical compounds, Blood, Blood banks, Agents, Standards, Public health, Biological laboratories.

Notice is hereby given that pursuant to section 351 of the Public Health Service Act, as amended (42 U.S.C. 262), and regulations issued thereunder (42 CFR Part 73), the following establishments are licensed as of April 15, 1961, for the production of the biological products set forth under each establishment. Such licenses are effective until suspended or revoked in accordance with such Act and regulations.

PB-217 375
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WATER SUPPLY FACILITIES OF COMMUNITIES OF 25,000 POPULATION AND OVER (1954) INCLUDING STATE TABULATIONS.
Summary rept.,
Ralph Porges. 5 Apr 56, 27p

Descriptors: (*Water supply, *Inventories), (*Water treatment, *Inventories).

The report presents a summary and a condensed analytical review of the Inventory of Municipal Water Facilities - Communities of 25,000 Population and Over, as of December 31, 1954 issued by the Public Health Service, November, 1955. Comparisons have been made with previously published reports to ascertain trends.

PB-217 376
Pollution Control Council, Portland, Oreg. Pacific Northwest Area.
A SURVEY OF THERMAL POWER PLANT COOLING FACILITIES. (REPORT ON TRIP TO SEVEN THERMAL POWER PLANTS, DECEMBER 1968),
Robert W. Zeller, Herbert E. Simpson, E. Jack Weathersbee, Harold Patterson, and George Hansen. Apr 69, 77p

Descriptors: (*Pacific Northwest, Water pollution), (*Water pollution, Heat), (*Electric power plants, Water pollution), Colling water, Surveys.
Identifiers: *Thermal pollution.

Attention is focused to environmental aspects of thermal power plant siting in the Northwest. An interagency tour of thermal power plants is organized and a tour of seven power plants was completed. Included were five coal-fired plants in eastern United States, one gas/oil plant at Long Beach, California, and a nuclear power plant near San Clemente, California. The general purpose of the power plant visits was to personnaly observe the impact of various cooling methods on air and water quality.

PB-217 377
Southeastern Radiological Health Lab., Montgomery, Ala.
INTRODUCTION TO MICROWAVE ENERGY: PRINCIPLES AND APPLICATIONS,
William A. Herman. 1970, 14p BRH/SERHL-70-6
Presented at the Meeting of the Alabama Sanitarians Association, Montgomery, Ala. 26 Feb 70.

Descriptors: (*Microwaves, *Radiobiology), (*Radiation hazards, Microwaves), Radar, Ovens, Standards.
Identifiers: *Microwave radiation leakage, *Electromagnetic radiation hazards.

The paper presents an introduction to the principles and applications of microwave energy and the associated hazards of its use.

PB-217 378
Public Health Service, Kansas City, Mo. Region VI.
TRANSCRIPT OF CONFERENCE. POLLUTION OF INTERSTATE WATERS, MISSOURI RIVER. KANSAS CITY METROPOLITAN AREA.

3 Dec 57, 90p

Descriptors: (*Missouri River, *Water pollution), (*Kansas, Water pollution), (*Missouri, Water pollution), Proceedings.
Identifiers: *Kansas City (Kansas).

The conference concerning the matter of pollution of interstate waters of the Missouri River in the Kansas City Metropolitan area, involving the States of Kansas and Missouri, was held under the provisions of the Federal Water Pollution Control Act and, in accordance with the terms of that Act, was called by the Surgeon General of the Public Health Service. The purpose of the conference was to bring together the State Water Pollution Control Agencies, the localities concerned and industries and the Public Health Service to review the existing situation, the progress which has been made, and to lay a basis for future action by all parties concerned and to give the states and localities an opportunity to take any remedial action which may be indicated under state and local law.

PB-217 379
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
LAKE ERIE SURVEILLANCE DATA SUMMARY, 1967-1968.

May 68, 69p

Descriptors: (*Lake Erie, *Water pollution), Biological surveys, Chemical composition, Tables (Data).
Identifiers: *Water quality data.

Although Lake Erie is still an excellent source of municipal raw water, the effects of pollution are becoming ever more discernible. The report presents the results of a 1967-1968 survey. The dissolved solids have increased by nine percent since 1964 with progressively higher concentrations from west to east. Most chemical constituents in both water and sediment have increased during the same period. High populations of phytoplankton. Bloom conditions were not noted during the 1967-68 sampling period. Pollution-sensitive types, such as sludgeworms and bloodworms, were in profusion. The limited winter program revealed higher bacterial densities in western basin bottom waters as opposed to the nonwinter 1963-64 findings where the highest densities were found in the surface waters.

PB-217 380
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT ON NORTH PLATTE RIVER SURVEY WYOMING-NEBRASKA.
Rept. for Sep-Nov 61,
F. W. Kittrell. Feb 62, 110p

Descriptors: (*Platte River Basin, *Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution), Food processing.
Identifiers: *Water quality data, *Sugar beet processing.

An investigation of the North Platte was made during the 1961-62 sugar beet campaign to obtain bacteriological, biological, chemical, stream flow, and other pertinent data to properly assess the sources of industrial and municipal wastes, the kinds of coliform bacteria present in the river, and their effects on water quality. The area studied extended from above Torrington, Wyoming downstream to Bridgeport, Nebraska, a distance of about 67 miles.

PB-217 381
Federal Water Pollution Control Administration, Boston, Mass. Northeast Region.
CHARACTERIZATION OF BENTHIC SEDIMENTS OF THE ST. CROIX RIVER.
Warren H. Oldaker, and Edward L. Taylor. Aug 68, 18p FWPCA-CWT-10-2

Descriptors: (*Saint Croix River, *Benthos), Maine, Dredging.

During the survey by the U.S. Army, Corps of Engineers to determine the location and volume of benthic sediments in the St. Croix River, in Maine and New Brunswick, portions from each boring were analyzed. Organic carbon and organic nitrogen were determined. The purposes of the study were to attempt to characterize the sediments and substantiate the physical findings of the Corps of Engineers.

PB-217 382
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes Region.
WATER QUALITY INVESTIGATIONS, LAKE MICHIGAN BASIN. POPULATION AND ECONOMY.
Technical rept.
Aug 67, 58p

Descriptors: (*Lake Michigan Basin, *Economic Development), Demography.

This is one in a series of reports documenting background information for the development of a water quality control program for Lake Michigan and its drainage basin. For planning purposes the Lake Michigan Watershed has been subdivided into appropriate tributary drainage basins. For the purpose of projecting water use and waterborne waste loads for these subbasins and in order to develop relationships among water uses, waste loads, population and economic development, information has been gathered on present conditions and past trends concerning population and economy. (Author)

PB-217 383
Florida Univ., Gainesville. Dept. of Environmental Engineering.
MODELING THE EUTROPHICATION PROCESS.
1969, 292p
Proceedings of a Workshop at St. Petersburg, Fla. 19-21 Nov 69.

Descriptors: (*Limnology, Mathematical models), (*Meetings, Limnology).
Identifiers: *Eutrophication.

The report contains papers presented at a workshop convened for the discussion of lake eutrophication. The papers develop mathematical models of processes involved in eutrophication. Free discussion relative to the presentations is included in the report.

PB-217 384
Purdue Univ., Lafayette, Ind. School of Mechanical Engineering.
TURBULENT DIFFUSION IN LIQUID JETS.
Interim annual rept. 1 Sep 68-31 Aug 69,
S. C. Chuang, C. H. Tinsley, Jr., and V. W. Goldschmidt. Nov 69, 84p

Descriptors: (*Particles, *Mass transfer), (*Turbulent diffusion, Mass transfer), (*Bubbles, *Turbulent diffusion), Particle size, Numerical analysis, Samplers, Anemometers.

The report summarizes research whose objective was to establish an effective method of tracking contaminants in a liquid jet. The ultimate objective was to determine the diffusion due to turbulence of contaminant particles of different sizes and specific gravities. (Author Modified Abstract)

PB-217 385
Federal Water Pollution Control Administration, Washington, D.C.
COMPENDIUM OF DEPARTMENT OF THE INTERIOR STATEMENTS ON NON-DEGRADATION OF INTERSTATE WATERS.
Aug 68, 58p

Descriptors: (*Water pollution, Standards), Government policies, National government.
Identifiers: *Water pollution standards.

One of the most significant problems that the Department of the Interior and the Federal Water Pollution Control Administration have encountered in the setting of water quality standards is what has come to be known as the non-degradation issue. This states in part, 'In no case will standards providing for less than existing water quality be acceptable.' The compendium brings together the interpretations of Secretary Udall and other Department of the Interior officials relating to the meaning and impact of the non-degradation policy. There are also attached copies of non-degradation statements which have been approved by the Secretary. It is designed to contribute to an increased understanding of the nature of the non-degradation issue and the way in which it has been resolved. (Author Modified Abstract)

PB-217 3..
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
REPORT ON POLLUTION OF LAKE ERIE AND ITS TRIBUTARIES. PART 3. NEW YORK AND PENNSYLVANIA SOURCES.

Jul 65, 21p

Descriptors: (*Lake Erie, *Water pollution), (*New York, Water pollution), (*Pennsylvania, Water pollution).

Pollution problems in three areas tributary to Lake Erie within Pennsylvania and New York, are also discussed.

PB-217 387
Catholic Univ. of America, Washington, D.C. Dept. of Chemical Engineering.
SORPTION BEHAVIOR OF ORGANIC PYROPOLYMERS IN AQUEOUS SOLUTION.
Rept. for 1 Jun 68-30 Apr 69,
Stephen D. Bruck. 1969, 19p
Grant FWPCA-WP-01371-01-1A

Descriptors: (*Adsorption, *Herbicides), (*Sewage treatment, *Organic compounds), Phenols, Polymers, Carbon, Pyrolysis.

Water renovation damands the efficient removal of soluble refractory organic materials and ions from secondary effluents. This process may be carried out with activated carbon granules, the adsorption properties of which have been the subject of investigations. Despite its high effectiveness, activated carbon is relatively expensive and some problems are encountered in the regeneration process. The object of this preliminary feasibility study was to evaluate the sorption properties of selected organic pyropolymers especially with respect to organic materials and to compare the results with those obtained with activated carbons by other workers.

PB-217 388
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
INSTRUMENTS FOR DETECTION AND IDENTIFICATION OF RADIOACTIVITY IN ENVIRONMENTAL MEDIA.
Gerald J. Karches, Byron M. Branson, and Conrad P. Straub. 1960, 15p SEC-TR-R60-3

Descriptors: (*Radioactive contaminants, *Radiation measuring instruments).

The paper describes and illustrates the variety of instruments available at the Center for measurement of radioactivity in various environmental media. Shown are instruments that may be used for the measurement of gross radioactivity; those for measuring specific kinds of radioactivity as from alpha, beta, or gamma emitters; and instruments such as the gamma spectrometer for identification of specific radionuclides. (Author Modified Abstract)

PB-217 389
Southeastern Radiological Health Lab., Montgomery, Ala.
RADIUM SAFETY, SAFETY STORAGE RESEARCH AT THE SOUTHEASTERN RADIOLOGICAL HEALTH LABORATORY.
1973, 31p

Descriptors: (*Radium isotopes, *Radiation hazards), Safety.

The booklet is designed to acquaint the public community and others interested in radium-226 with the research programs being conducted at the Southeastern Radiological Health Laboratory to minimize radiation dangers of radium. Radium-226 is a radioactive element which has application in industry and particularly in medicine. Its use requires caution. Since its discovery about 70

years ago, about 1,300 grams of this nuclide are unaccounted for in the United States. Improper use of radium-loaded devices, sources, and damaged sources, such as these shown at the left, represents a radiation danger to health. Elimination or reduction of this health problem can be accomplished through application of proper handling, testing and management techniques in the use of radium. To this end, improvements in transportation, leak testing, and in assessment of radium and its radiation dose to humans are being studied. Several aspects of research activities are discussed, including safe storage of unwanted radium, development of effective leak-test methods, and handling equipment. (Author)

PB-217 390
Public Health Service, Little Rock, Ark. Southwest-Lower Mississippi Drainage Basins Office.
SUMMARY REPORT ON WATER POLLUTION, SOUTHWEST-LOWER MISSISSIPPI DRAINAGE BASINS.
Water pollution series.
1951, 157P PHS-Pub-160, PHS-WPS-16
Library of Congress Catalog Card No. 52-60883.

Descriptors: (*Mississippi River Basin, *Water pollution), (*United States, *Water resources), Arkansas, Colorado, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee, Texas.

The summary report presents information about the way our water resources are used, the pollution going into our water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required. It is prepared in two parts. Part one considers the water pollution problems of the basin as a whole. Part two presents briefly the data for each of the several sub-basins of the major basin, including a list of projects now known to be needed for water pollution control.

PB-217 391
Public Health Service, Dallas, Tex. Region VII.
WATER RESOURCES STUDY, SOUTHEASTERN OKLAHOMA AND SOUTHWESTERN ARKANSAS. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER FOR MUNICIPAL, INDUSTRIAL, AND QUALITY CONTROL PURPOSES.
Jul 62, 33p
Prepared in cooperation with Army Engineer district, Tulsa, Okla.

Descriptors: (*Oklahoma, *Water resources), (*Arkansas, *Water resources), Reservoirs, Water supply.

The report presents the results of a study of the need for water for municipal, industrial, and quality control purposes, which could be supplied from 11 reservoirs located in southeastern Oklahoma and southwestern Arkansas. The reservoirs under investigation are Pine Creek, Lukfata, Broken Bow, DeQueen, Dierks, Gillham, and Millwood in the Little River basin system; Boswell on Boggy Creek; and Hugo, Clayton, and Tuskahoma in the Kiamichi River basin system.

PB-217 392
Public Health Service, Washington, D.C.
A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL FOR THE ST. CROIX RIVER BASIN.
Water pollution series rept.
1953, 12P PHS-Pub-335 WP-60
Prepared in cooperation with State Water Pollution Control Agencies.

Descriptors: (*Saint Croix River Basin, *Water pollution), (*Minnesota, Water pollution), (*Wisconsin, Water pollution).

Water pollution has become a serious problem, and its effects on the public health and national resources are a matter of concern as a menace to national welfare. Abatement must be undertaken in order to control it. The publication summarizes a comprehensive water pollution control program for the St. Croix River Basin of the Minnesota State Department of Health and the Wisconsin Committee on Water Pollution.

PB-217 393
Drexel Inst. of Tech., Philadelphia, Pa.
SOIL MOISTURE AVAILABILITY FOR TRANSPIRATION,
F. J. Molz, Irwin Remson, A. A. Fungaroli, and R. I. Drake. Sep 68, 29p

Descriptors: (*Transpiration, *Soil water), Mathematical models, Moisture.

Potential transpiration is a measure of the rate at which water can be transmitted from evaporation sites in plant leaves to the atmosphere. Potential soil-moisture availability is defined as a measure of the capacity of a soil to transmit water to a root site. A differential equation is presented describing radial flow of soil moisture to a single vertical sink (root) in an infinite soil mass which is initially at a uniform moisture content. The relationship between moisture content and diffusivity for the soils studied may be represented by an exponential function. A numerical solution of the differential equation is used to determine the soil-moisture flux. (Author Modified Abstract)

PB-217 394
California Univ., Berkeley. Sanitary Engineering Research Lab.
KINETICS OF HYDROGEN ASSIMILATION IN METHANE FERMENTATION,
Timothy G. Shea, W. A. Pretorius, R. D. Cole, and F. A. Pearson. Aug 68, 149p SERL-68-7
Grant PHS-WP-00830

Descriptors: (*Fermentation, *Microbiology), (*Anaerobic processes, Microbiology), Methane, Carbon dioxide, Hydrogen, Reaction kinetics.
Identifiers: *Methane bacteria.

The anaerobic fermentation of organic wastes is a stepwise degradation process which is initiated with solubilization of particulate matter and the production of volatile acids from simple and complex organic molecules, and is completed by the evolution of methane and carbon dioxide. The methane-producing stage appears to be the rate-limiting step in the overall process. The report determines the microbiological kinetic constants of the methane bacteria which ferment hydrogen, utilizing continuous-flow fermentors, and evaluates experimentally the effect of hydrogen on the methane fermentation of volatile acids.

PB-217 395
Public Health Service, Washington, D.C.
AN INDUSTRIAL WASTE GUIDE TO THE MILK PROCESSING INDUSTRY.

1953, 20p PHS-Pub-298
Prepared in cooperation with the National Technical Task Committee on Industrial Wastes. Subcommittee on Dairy Waste Disposal.

Descriptors: (*Food processing, *Milk), Manuals.
Identifiers: *Water pollution control.

The publication represents the efforts of waste technologists and others of the Dairy Industry to develop a concise practical Guide for milk plant operating and design personnel. It emphasizes the appreciable reduction of waste which can be accomplished through waste prevention measures which can be carried out within the processing plant. Practical methods of carrying out such waste saving measures are described.

PB-217 396
Communicable Disease Center, Atlanta, Ga.
PROCEDURES FOR TESTING PASTEURIZATION EQUIPMENT,
H. E. Eagan. 1960, 48p PHS-Pub-731

Descriptors: (*Pasteurizing, *Milk), Inspection.

Contents:
- Equipment needed to test pasteurization plant equipment;
- Tests of vat-type pasteurization plant equipment;
- Tests of short-time high-temperature pasteurization plant equipment;
- Inspectional aspects relative to short-time high-temperature pasteurization;
- Tests of pasteurization plant equipment-vacuum pasteurizer (vacreator).

PB-217 397
Public Health Service, Dallas, Tex. Region VII.
WATER RESOURCES STUDY, TRINITY RIVER BASIN, TEXAS. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER FOR MUNICIPAL, INDUSTRIAL, AND QUALITY CONTROL PURPOSES.
Oct 62, 140p
Prepared in cooperation with Army Engineer Districts, Fort Worth, and Galveston, Tex.

Descriptors: (*Trinity River Basin, *Water resources), (*Texas, *Water resources), Reservoirs, Water consumption, Water pollution.

The objective of the report is the determination of water requirements for municipal, industrial, and water quality control purposes to the year 2070 in the Trinity River basin including the Houston municipal and industrial complex. Estimates are made of the benefits attributable to the storage of water for meeting these requirements in proposed Federal reservoirs. To arrive at these needs, studies are made of the economic and demographic variables which affect water consumption. These are then projected to the terminal year of the study (2070), combined with projected unit water usage and translated into municipal and industrial water requirements. The amounts of wastes which result from these uses are calculated and the quantity of water required to preserve stream quality is determined. In addition to determining requirements, a basinwide plan for supplying these needs is developed, which provides for orderly and efficient utilization of potential water resources within the basin with full recognition of all permits, commitments, and agreements executed by local interests. (Author)

PB-217 398
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
AN INDUSTRIAL WASTE GUIDE TO THE WOOL PROCESSING INDUSTRY.
1955, 18p PHS-Pub-438
Prepared in cooperation with American Association of Textile Chemists and Colorists. Stream Abatement Committee.

Descriptors: (*Water pollution, Textile industry), (*Textile industry, *Industrial waste treatment), Woolen textiles, Industrial wastes.
Identifiers: *Water pollution control.

The Guide summarizes the sources of pollution in the wool-processing industry, the polluting effects of woolen-mill wastes, and information on the methods of dealing with the waste problems of the industry. Four separate operations of the industry produce liquid wastes: opening and scouring, spinning, dyeing, and finishing. Significant polluting characteristics of these individual wastes include oxygen demand, suspended solids, acidity, alkalinity, color, and grease. The polluting effect of the wastes may be reduced by substituting detergents for soap, mineral acids for acetic, synthetic compounds for starch, and similar changes. Limiting the amounts of acids, bases, and

reducing agents to the actual requirements for the process also will reduce waste loads. Wool fibers, wool grease, and fertilizer material all may be recovered from the wastes. The wastes may be treated in combination with domestic sewage, or they may be treated by (1) coagulation and precipitation with chemicals, (2) chlorination, (3) biological processes, and (4) adsorption. The information contained in this Guide can help the mill supervisor carry out his increasing responsibility to reduce the polluting effect of the mill wastes. Much can be accomplished through good housekeeping procedures which also reduce operating costs.

PB-217 399
Communicable Disease Center, Atlanta, Ga.
BIOLOGICAL FACTORS IN DOMESTIC RODENT CONTROL.
Rodent control series,
Robert Z. Brown. 1960, 36p PHS-Pub-773-RCS-2

Descriptors: (*Rodent control, Biology), (*Rats, Rodent control), (*Mice, Rodent control).

Because of the differences between the individual rodent and the population, the report is divided into two main sections. The first part deals with individual rats, and mice, their identification, distribution, and life history. The second part deals with the characteristics of rodent populations and the principles of rodent control.

PB-217 400
National Communicable Disease Center, Atlanta, Ga.
PICTORIAL KEYS TO ARTHROPODS, REPTILES, BIRDS AND MAMMALS OF PUBLIC HEALTH SIGNIFICANCE.
Jun 69, 197p PHS-Pub-1955
Paper copy available from GPO $2.25 as FS 2.60/7:AR 7/2.

Descriptors: (*Disease vectors, Identifying), (*Public health, Disease vectors), Taxonomy, Diagrams, Anatomy, Arthropoda, Reptiles, Birds, Mammals.

Public health biologists are often responsible for teaching animal indentification to personnel (sanitarians, engineers, physicians, veterinarians, etc.) without special training in taxonomy. One of the most successful devices for such training has been the pictorial key. After the Communicable Disease Center was founded (1946) many such keys were developed. At present the Center utilizes more than 75 such keys in its regular training program. These are the major items incorporated into this booklet. Apropos morphological diagrams are also included. Precise identification of disease vectors is essential to their efficient control. The pictorial keys are typical of identification keys found in reference works and scientific papers except that they are arranged as diagrams and are illustrated.

PB-217 401
Environmental Protection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
CONDENSED ONE-PAGE COST ESTIMATES FOR WASTEWATER TREATMENT,
Richard G. Eilers. Nov 70, 10p

Descriptors: (*Sewage treatment, Cost estimates), Capitalized costs, Construction costs, Operating costs, Maintenance.

Construction cost, amortization cost, operation and maintenance cost, and total treatment cost were calculated for various wastewater treatment processes at volume flows of 1, 7.5, 10 and 100 mgd. All construction costs were adjusted to January 1970 dollars using the construction cost index; operation and maintenance costs were adjusted to January 1970 dollars using the consumer price index. Amortization costs were calculated based on 25 years at 6% interest. Graphs of construction costs and total treatment costs versus flow for the various processes are given.

PB-217 402
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
PALOUSE RIVER TRANSECT STUDY. STATION NO. 153010, JULY 8 AND 9, 1969,
Gary L. Burns. Feb 70, 37p Working Paper-73

Descriptors: (*Palouse River, *Water pollution), (*Idaho, Water pollution).
Identifiers: *Water quality data.

The purpose of this study is to document seasonal , diurnal, and spatial variances in water quality at Station No. 153010 located at River Mile 126.5 on the Palouse River between the towns of Potlatch, Idaho and Palouse, Washington. (Author Modified Abstract)

PB-217 403
Public Health Service, Washington, D.C.
PROTECTING OUR WATER RESOURCES. THE FEDERAL WATER POLLUTION CONTROL PROGRAM.
1962, 29p PHS-Pub-950

Descriptors: (*Water pollution, *Government policies), National government.

Concepts in water pollution control are changing to meet the impact of population and industrial growth. No longer can the use of waterways as receptacles of uncontrolled wastes be accepted as a legitimate use of water. All users of waters have a responsibilit for returning those waters to the stream as clean as is technically possible. This is the new scope of national water pollution control policy. (Author)

PB-217 405
Robert A. Taft Water Research Center, Cincinnati, Ohio.
COMBINED BIOLOGICAL AND CHEMICAL TREATMENT FOR PHOSPHORUS REMOVAL,
Michael C. Mulbarger, and Donald G. Shifflett.
1970, 11p
Availability: Pub. in Chemical Engineering Progress. Symposium Series, v67 n107 p107-116 1970.

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Chemical removal (Sewage treatment), *Phosphorus), (*Alums, Sewage treatment), Precipitation (Chemistry).

Liquid alum and sodium aluminate were utilized for phosphorus removal at 1.0 and 0.2 million gal./day activated sludge municipal wastewater treatment plants. Phosphorus removals were determined at aluminum to phosphorus ratios up to a limiting point which exhibited a minimum total soluble phosphorus residual of about 1.0 mg./liter. More efficient use of chemical and higher phosphorus removal efficiencies are obtained in a multistage activated sludge system. The type of activated sludge system also influenced chemical phosphorus removals. Excessive effluent suspended solids were found to be more a function of the volatile solids produced to aluminum added ratio than of exceeding a given aluminum to phosphorus ratio or aluminum dosage. Batch studies indicate that aluminum as alum will outperform iron as ferric chloride on a performance/cost basis and that the best point of addition is just before solids-liquid separation. The considerations involved in this type of phosphorus removal system are discussed. (Author)

PB-217 406
Environmental Health Center, Cincinnati, Ohio.
THE USE OF BIOLOGICAL WARFARE AGENTS IN PUBLIC WATER SUPPLIES,
Keith H. Lewis. 25 Jun 53, 5p
Presented at the Federal Civil Defense Administration Region 2 Engineering Conference, Olney, Md., 25 Jun 53.

Descriptors: (*Biological agents, *Civil defense), (*Water supply, Biological agents).

The report very briefly lists the threats of biological warfare agents (BW agents), why water supplies are vulnerable, defensive measures, characteristics of an ideal BW agent for use in water supplies and some common diseases which can be obtained orally.

PB-217 407
Environmental Health Center, Cincinnati, Ohio.
ARKANSAS OIL FIELD WASTES AS RELATED TO LAKE CORNEY AND CORNEY CREEK POLLUTION IN VICINITY OF ARKANSAS--LOUISIANA STATE LINE,
Hayse H. Black, Sr. Sep 49, 73p

Descriptors: (*Corney Lake, *Water pollution), (*Arkansas, Water pollution), (*Louisiana, Water pollution), (*Brines, Water pollution), Oil fields, Oil wells.
Identifiers: *Fishkill.

The principal objectives were to determine the cause for intermittent fish destruction in Corney Creek, above Corney Lake, during the past several years and to consider possible measures for abating pollution caused by Arkansas oil fields located in Corney Creek drainage basin.

PB-217 409
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
PRELIMINARY INVESTIGATION OF MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND STREAM QUALITY CONTROL REQUIREMENTS AND BENEFITS ASSOCIATED WITH MULTIPLE-PURPOSE STUDIES OF THE PROPOSED SCOGGINS RESERVOIR, TUALATIN PROJECT, WASHINGTON COUNTY, OREGON.

Mar 62, 70p Working Paper-21
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Tualatin River Basin, *Reservoirs), (*Oregon, *Water resources), Scoggins Reservoirs, Forecasting.
Identifiers: *Washington County (Oregon).

The report represents a preliminary examination of present and future municipal and industrial water supply and stream quality control needs in the Tualatin River Basin with particular reference to the feasibility of providing storage and/or flow regulation to serve these needs in the Bureau of Reclamation's proposed Scoggins Reservoir of the Tualatin River Project, Washington County, Oregon. The report identifies uses and sources of water in the Tualatin Valley area and describes sources of waste, waste treatment practices and the effect of waste effluents and other materials on the quality of specific reaches of the Tualatin Valley area and describes sources of waste, waste treatment practices and the effect of waste effluents and other materials on the quality of specific reaches of the Tualatin River.

PB-217 410
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
PRELIMINARY INVESTIGATION OF WATER SUPPLY AND WATER QUALITY CONTROL ASPECTS, YAKIMA PROJECT, WASHINGTON, KENNEWICK DIVISION EXTENSION.

Dec 61, 6p Working Paper-19

Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Yakima River, *Reservoirs), (*Washington (State), *Water resources).

The report presents preliminary impressions relating to municipal and industrial water supply and stream quality control aspects associated with the proposed Kennewick Extension, Yakima Project, Washington.

PB-217 411
Toronto Univ. (Ontario). Great Lakes Inst.
TAXONOMY AND BIOLOGY OF SLUDGE WORMS.
Terminal rept. 1 Jun 66-31 May 69,
R. O. Brinkhurst. 31 May 69, 29p
Grant FWPCA-WP-00940

Descriptors: (*Water pollution, Indicator species), (*Worms, Indicator species), Research, Canada.
Identifiers: Oligochaetes.

The report briefly describes research undertaken to identify as many of the aquatic oligochaetes of North America and Europe as possible, and to fit the identifications to those of the world in a review of the systematics (relationship) and nomenclature (naming) of the group; to plot their distribution geographically; to evaluate the species in terms of their value as indicators of pollution; and to gain some insight into the basic biological parameters of the more important species so that the role of worms in relation to self-purification and eutrophication might be investigated.

PB-217 412
Missouri Basin Interagency Committee.
THE MISSOURI: A GREAT RIVER BASIN OF THE UNITED STATES. ITS RESOURCES AND HOW WE ARE USING THEM.

1958, 36p PHS-Pub-604

Descriptors: (*Missouri River Basin, *Water resources), (*Reservoirs, Missouri River Basin), Irrigation, Flood control, Flow control.

The report presents a historical narrative of the development of the Missouri River and its tributaries for the purpose of water and soil conservation. Future plans for continuous development are itemized.

PB-217 413
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
PUBLIC SEWAGE TREATMENT PLANT CONSTRUCTION.
1955, 20p PHS-Pub-453

Descriptors: (*Sewage treatment, *Contracts), Construction, Inventories.
Identifiers: *Sewage treatment plants.

The report on the construction of public sewage treatment plants for the calendar year 1954 supplements and brings up to date the information contained in the 1952 and 1953 construction reports made by the Public Health Service. It indicates the progress made by municipalities in the United States during 1954 in providing the sewage treatment facilities necessary to prevent pollution of water resources on which downstream water users depend.

PB-217 414
Public Health Service, Cincinnati, Ohio. Ohio-Tennessee Drainage Basins Office.
SELECTED BIBLIOGRAPHY OF PUBLICATIONS RELATING TO UNDESIRABLE EFFECTS UPON AQUATIC LIFE BY ALGICIDES, INSECTICIDES, AND WEEDICIDES.
Bibliography series,
William Marcus Ingram, and Clarence M. Tarzwell. 1 Jun 54, 32p PHS-Pub-400, PHS-BS-13

Descriptors: (*Water pollution, *Pesticides), (*Bibliographies, Water pollution), Insecticides, Herbicides, Algicides.
Identifiers: *Water pollution effects (Animals), *Water pollution effects (Plants).

The papers which are included in this bibliography contain data on the harmful effects of algicides, insecticides, and weedicides on aquatic organisms other than those which they were designed to control. A bibliography published in 1953 by the U.S. Public Health Service, lists pertinent articles on the effectiveness of various chemicals for the control of algae and the higher aquatic plants. Algicides, insecticides and weedicides perform an important and essential function. The purpose of the report is not to discourage their use but rather to enable those who use these economic poisons to minimize or eliminate their damages to aquatic life.

PB-217 415
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
STUDIES ON HOUSEHOLD SEWAGE DISPOSAL SYSTEMS. PART III,
S. R. Weibel, T. W. Bendixen, and J. B. Coulter.
1954, 150p PHS-Pub-397
Report on Research Reports on Individual Sewage Disposal Systems.

Descriptors: (*Septic tanks, Design), Residential buildings, Detergents, Soil properties, Performance evaluation.

Studies on Household Sewage Disposal Systems, Part III, 1954,' the third progress report of a series, deals with continuance of studies on home septic tank details, including multicompartmentation arrangements, capacity, shape, depth, surface area, outlets, sludge and scum accumulations, effect of flow variation; soil absorption factors, including appraisal of absorption capacity, physical, chemical, and biological clogging behaviors, intermittent dosing; and effects of water softener brine and ground garbage. Additional undertakings reported include studies on detergents, evapotranspiration as an influence in effluent disposal, flow distribution devices, sludge and scum gaging devices, tank improvements to facilitate maintenance, and the effect of caustic soda.

PB-217 416
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER QUALITY CONTROL STUDY NORWICH RESERVOIR NINNESCAH RIVER BASIN KANSAS.
Nov 66, 37p

Descriptors: (*Ninnescah River, *Reservoirs), (*Arkansas River Basin, *Reservoirs), (*Kansas, *Water resources), Forecasting, Norwich Reservoir.

The study was made to examine the probable effects of the proposed project on water quality in the Arkansas River; to determine the benefits or harm resulting from changes in water quality; to evaluate the suitability of the water for proposed water quality uses; and, to determine the need for and the value of storage for regulation of streamflow for the purpose of water quality control. The study streams are the Ninnescah River, and that part of the Arkansas River from the city of Wichita, Kansas to Kaw Reservoir. The need for streamflow regulation was studied for present conditions and anticipated future conditions to the year 2070. (Author)

PB-217 417
Vanderbilt Univ., Nashville, Tenn.
ACTIVATED SLUDGE AS AN ECOLOGICAL SYSTEM.
Summary progress rept. 1 Mar-31 Dec 67,
George W. Malaney. 31 Dec 67, 30p
Grant PHS-WP-00816-03

Descriptors: (*Activated sludge process, *Microbiology).

A progress report is presented under the following headings: Isolation and propagation of bacteria from activated sludge, identification of bacterial strains, enumeration of aerobic bacteria, and analysis of a primary effluent for content of saturated monocarboxylic acids. (Author Modified Abstract)

PB-217 418
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
SEDIMENT PRODUCTION RATING, UMPQUA BASIN, OREGON,
W. E. Bullard. Jan 62, 12p Working Paper-9
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Umpqua River Basin, *Suspended sediments), (*Oregon, Water pollution), (*Water pollution, Umpqua River Basin).

The sediment production rating is an attempt to assess a major impact of land condition, use, and management in a watershed on the quality of water produced by that watershed. The rating for the Umpqua Basin was done as a part of the Columbia Water Resources Project.

PB-217 419
Colorado State Univ., Fort Collins. Dept. of Agricultural Engineering.
TRANSPORT AND RETENTION OF VIRUS-SIZED PARTICLES IN POROUS MEDIA,
R. W. Filmer. and A. T. Corey. Dec 65, 130p
Grant PHS-WP-00349-01

Descriptors: (*Proteins, *Adsorption), (*Soil chemistry, Adsorption).

The aims of the study were: To study the transport and retention of proteinaceous particles by water in both fully and partially saturated sands with hydraulic gradients that occur in nature; and To explain the mechanism by which such particles are retained in soil materials and to determine the variables affecting retention.

PB-217 420
Department of Health, Education and Welfare, Washington, D.C.
CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE NORTH PLATTE RIVER. THIRD SESSION, HELD IN SCOTTSBLUFF, NEBRASKA ON NOVEMBER 20, 1963.
1963, 287p

Descriptors: (*Platte River, *Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution), Proceedings.

The third session of the conference in the matter of Pollution of The Interstate Waters of The North Platte River, involving the States of Wyoming and Nebraska, is presented. The purpose of the conference was to bring together the States and the Department of Health, Education, and Welfare, to lay a basis for future action and to give the States, localities and industries an opportunity to take any action which may be indicated under State and local law.

PB-217 421
Environmental Protection Agency, College, Alaska. Alaska Water Lab.

QUARTERLY RESEARCH REPORT JANUARY 1-MARCH 31, 1972.
31 Mar 72, 14p

Descriptors: (*Laboratories, *Alaska), Sewage treatment, Water resources, Cold weather operations.

The report very briefly summarizes the laboratories projects in such areas as cold region sewage treatment, Alaskan water quality, gravel removal on the North Slope, and ecology of tundra lakes.

PB-217 422
Public Health Service, Kansas City, Mo.
MISSOURI - SOURIS - RED RIVER BASINS, STUDY PLAN FOR A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM.
Jan 65, 127p

Descriptors: (*Missouri River Basin, *Project management), (*Red River of the North, *Project management), (*Souris River Basin, *Project management).

The study plan represents background material required for a program review of the Missouri-Souris-Red Rivers Basins Project. It contains information relative to budget, personnel, administrative and operational procedures likely to be encountered during the duration of the project.

PB-217 423
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER QUALITY CONTROL STUDY THE FRYINGPAN ARKANSAS PROJECT ARKANSAS RIVER SUBBASIN COLORADO.
Oct 68, 94p

Descriptors: (*Arkansas River, *Reservoirs), (*Colorado, *Water resources), Forecasting.

The purpose of the study was to appraise water requirements to the year 2070 for water quality control purposes in the Arkansas River basin above John Martin Reservoir, and to determine the need for and value of storage of water in the reservoirs of the proposed Fryingpan-Arkansas Project in the Arkansas River Basin, for the purpose of streamflow regulation for controlling water quality. The results presented are based on projected economic developments and anticipated needs for preservation of water quality in streams in the study area.

PB-217 424
Public Health Service, Porland, Oreg. Region IX.
PRELIMINARY INVESTIGATION OF MUNICIPAL, AND INDUSTRIAL WATER SUPPLY AND STREAM QUALITY CONTROL REQUIREMENTS AND BENEFITS ASSOCIATED WITH MULTIPLE-PURPOSE STUDIES OF THE PROPOSED LOWER GRANDE RONDE, AND CATHERINE CREEK RESERVOIR PROJECTS, OREGON.
Jun 62, 65p Working Paper-31
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Grande Ronde River Basin, *Reservoirs), (*Oregon, *Water resources), Forecasting.

The report represents a preliminary examination of present and future municipal and industrial water supply and stream quality control needs in the Grande Ronde River Basin, Oregon with particular reference to the feasibility of providing storage and/or flow regulation to serve these needs in the Corps of Engineers' proposed Lower Grande Ronde and Catherine Creek Reservoir Projects. The report identifies uses and sources of water in areas within and adjacent to the proposed project area and describes sources and effects of waste and land drainage materials on the quality of various reaches of Grande Ronde River Basin streams.

PB-217 425
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
NORTH PUGET SOUND AREA, SKAGIT AND WHATCOM COUNTIES, WASHINGTON. ECONOMIC BASE ANALYSIS AND PROJECTION, 1960-2010.
Nov 64, 16p Working Paper-49
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Puget Sound, *Economic development), (*Washington (State), Economic development), Forecasting.
Identifiers: *Skagit County (Washington), *Whatcom County (Washington).

The economic base of the North Puget Sound area rests upon three natural resources: Rich agricultural land; Forests, providing materials for lumber, plywood and pulp manufacturing; and The Puget Sound itself, which provides sea food for processing and supports recreation and boat-building industries. The report looks at the economic development in this area of Skagit and Whatcom Counties.

PB-217 426
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
HOLLEY RESERVOIR CALAPOOIA RIVER BASIN WATER QUALITY AND WATER SUPPLY REPORT.

Nov 69, 35p

Descriptors: (*Calapooia River Basin, *Water resources), (*Oregon, *Water resources), Holley Reservoir, Forecasting.

Available data on water uses, waste sources, and water quality were examined. Projections, supported by an economic base study, were made for conditions in 1985 and 2010. Water quality predictions, based on both typical and minimum hydrologic years, were made using mathematical models.

PB-217 427
Iowa State Univ., Ames. Engineering Research Inst.
PHYSICAL PROPERTIES OF SEVERAL COMMERCIAL FILTER AIDS. PART II.
Final rept.,
Charles S. Oulman, E. Robert Baumann, and John Shouse. 1 Sep 68, 44p ERI-267
Contract DAAK02-67-C-0408, Grant FWPCA-WP-00196

Descriptors: (*Filter aids, Propertics), (*Filtration, Filter aids), Performance evaluation, Diatomaceous earth, Perlite.

The study characterizes some of the filter aids suitable for water filtration in terms of those physical characteristics related to their effectiveness in the filtration process. The important physical characteristics of a filter aid include particle size and shape, and the volume of voids in the cake as it is formed on a filter septum for use in filtration.

PB-217 431
Federal Water Quality Administration, Cincinnati, Ohio.
REMOVAL OF ORGANICS FROM WASTEWATER BY ACTIVATED CARBON,
John N. English, Arthur N. Masse, Charles W. Carry, Jay B. Pitkin, and James E. Haskins. 1970, 8p
Pub. in Chemical Engineering Progress Symposium Series, v67 n107 p147-153 1970.

Descriptors: (*Sewage treatment, *Activated carbon treatment).

A 0.3-million gal./day, four-stage, fixed-bed, granular activated carbon pilot plant, complete with thermal regeneration facilities, continuously treated unfiltered, activated sludge wastewater treatment plant effluent for a four-year period. High-quality product water characterized by a COD of 10 mg./liter was produced on a routine basis. A 17% decrease in carbon capacity occurred between the first and fourth cycles (one cycle per year), at which time a steady state condition was established at a capacity between 45 to 50 lb. of dissolved COD per 100 lb. of carbon. Regeneration of the carbon was shown to be a feasible process and successful backwashing of the first stage carbon, which serves as a filter and an adsorber, made pretreatment of the wastewater treatment plant effluent unnecessary.

PB-217 432
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
RADIOACTIVE PARTICLES IN THE CINCINNATI ATMOSPHERE FEBRUARY 16 - MAY 12, 1955,
R. Louis Bradshaw, and Lloyd R. Setter. Sep 57, 20p

Descriptors: (*Fallout, *Ohio), (*Radioactive contaminants, Fallout), (*Air pollution, Radioactive contaminants), Particles.
Identifiers: *Cincinnati (Ohio).

The radioactivity of air particles in samples collected from 20 to 30 municipalities in the National Air Sampling Network, established in 1953, indicated an increase of beta radioactivity of 1000 fold or more immediately following known atomic weapon tests. It was suspected that substantial amounts of the total radioactivity might be associated with discrete particles which might find their way into the respiratory tract of man. The purpose of the study was to determine the radioactivity distribution of collected particles. Samples collected at the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, during the spring of 1955 provided the test material for this study, the results of which are reported in the document.

PB-217 433
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SEWAGE AND WATER WORKS CONSTRUCTION, 1963.

Jul 64, 17p PHS-Pub-758

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), Inventories.
Identifiers: *Sewage treatment plants.

The annual report of 'Sewage and Water Works Construction 1963' is published as one part of the basic data program required and authorized in Public Law 660 (as amended by Public Law 87-88), the Federal Water Pollution Control Act. The data published provides a continuing and ready source of information and reference as to how successfully the national needs in municipal water supply and pollution control are being met through construction of the necessary physical facilities. The publication also establishes important year-to-year cost trends in the national economic picture in the three types of public works construction involved.

PB-217 434
Sanitary Engineering Center, Cincinnati, Ohio.
OHIO RIVER POLLUTION SURVEY. VOLUME 2, NUMBER 5.
Activities bulletin Sep-Oct 40.

1940, 17P

Descriptors: (*Ohio River Basin, *Water pollution).

The report identifies sources of water pollution in the Ohio River Basin and describes remedial action taken and proposed to alleviate the pollution problem.

PB-217 435
Kansas Univ., Lawrence. Center for Research in Engineering Science.
TRACE ELEMENT NEEDS OF FILAMENTOUS MICROORGANISMS,
John T. Pfeffer. Dec 67, 84p
Grant FWPCA WP-00646

Descriptors: (*Sewage treatment, Microorganism control (Sewage)), (*Fungi, *Microorganism control (Sewage)), (*Fusarium, Microorganism control (Sewage)), Nutrients, Metabolism, Inhibitors.

The following conclusions are drawn from the results of the study: Extreme care must be exercised in the preparation of chemically defined media if precipitation of trace metals is to be prevented. The only trace metal required for growth of the fungus, Fusarium, on acetate, glucose and glycerol media was iron. Zinc was a stimulant for Fusarium growth on acetate and glucose, but was not required for moderate growth. The only trace metal required for growth of the fungus, Geotrichum on glucose and glycerol media was zinc. This organism required only iron for growth on acetate medium. Iron was a stimulant for Geotrichum growth on glucose and glycerol, but was not required for moderate growth. Glucose media containing only the trace metals iron and manganese yielded the optimum growth characteristics for the mixed culture studies. Acetate media containing only the trace metals iron or manganese yielded the optimum growth characteristics for the mixed culture studies.

PB-217 436
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
WATER QUALITY AND AQUATIC BIOLOGY, EAST FORK KAWEAH RIVER. MINERAL KING AREA CALIFORNIA.
Aug 69, 40p

Descriptors: (*Kaweah River, *Water pollution), (*California, Water pollution), Biological surveys, Chemical composition.
Identifiers: *Sequoia National Forest, *Mineral King Valley.

Water quality and aquatic biological surveys were conducted during November 1967, and June and August 1968 on the East Fork Kaweah River in the Mineral King section of the Sequoia National Forest, California. The purpose of these surveys was to document the present quality of this stream prior to development of a year-round recreational area. Sampling included field measurements of temperature, dissolved oxygen, pH, and electrical conductivity; water samples were analyzed for nitrogen and phosphorus forms, iron and chlorophyll. Biological assessments included algal growth potential and enumeration and identification of planktonic and attached algae and benthic animals. (Author Modified Abstract)

PB-217 437
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
TASTE AND ODOR PRODUCING SUBSTANCES IN WATER,
M. B. Ettinger, and A. A. Rosen. 1957, 11p
Presented at Ontario Industrial Waste Conference (4th), Honey Harbour, Ontario, Canada, June 9-12, 1957.

Descriptors: (*Water pollution, *Taste), (*Water pollution, Odors).

The evident trend in the taste and odor quality of raw water is downward. Estimates of stream pollution in terms of population equivalents show an ever-upward trend. Taste and odor loads may be expected to increase more rapidly than loads in terms of 'population equivalents' because of many factors. Subject to relief by self-purification in streams, organic pollutants of surface waters present an additive assault on water quality, and each tangible organic source is a factor in determining the odor of the resulting water. These topics are discussed.

PB-217 438
Environmental Health Center, Cincinnati Ohio.
CAPACITY OF NATURAL WATERS TO ASSIMILATE WASTES,
Hayse H.Black, and Gerald N. McDermott. 1952, 35p
Presented at the Annual Symposium, Water Conservation and Industrial Development (2nd), Baton Rouge, La., Nov. 19-20 52.

Descriptors: (*Water pollution, *Limnology), (*Stream pollution, Purification).
Identifiers: *Self purification.

The paper discusses basic concepts concerning factors which determine the capacity of receiving waters to assimilate municipal and industrial wastes.

PB-217 439
Environmental Health Center, Cincinnati, Ohio.
ALABAMA-COOSA RIVER BASIN HOWELL MILL SHOALS RESERVOIR: REPORT ON EFFECTS OF PROPOSED RESERVOIR ON POLLUTION PROBLEMS IN ALABAMA-COOSA RIVER BASIN,
Robert P. Morfitt, and Russell S. Smith. Jul 51, 38p

Descriptors: (*Alabama River Basin, *Water pollution), (*Coosa River Basin, *Water pollution), (*Alabama, Water pollution).
Identifiers: *Water quality data.

The present investigation has consisted primarily of the assembly, tabulation, presentation, and study of existing data. The following types of information were tabulated and analyzed: (1) air temperature records; (2) Data on sources of pollution; (3) Data on surface water supplies; (4) Laboratory data; (5) Hydrometric data.

PB-217 440
Public Health Service, Portland, Oreg. Region IX.
PROCEEDINGS OF THE PACIFIC NORTHWEST SYMPOSIUM ON WATER POLLUTION RESEARCH (9TH). RESEARCH IN WATER POLLUTION AND OTHER ENVIRONMENTAL HEALTH FIELDS,
Edward F. Eldridge. Apr 60, 149p

Descriptors: (*Water pollution, Meetings), Research management, Public health.

The theme of the symposium was a re-evaluation of research needs, facilities, personnel and financing in the field of water pollution and an introduction to other environmental health fields. The papers presented are reported.

PB-217 441
Public Health Service, Washington, D.C. Div. of Sanitation.
SANITARY LANDFILL VERSUS INCINERATION,
Ralph J. Van Derwerker. 1973, 11p

Descriptors: (*Waste disposal, *Earth fills), (*Waste disposal, *Incinerators).
Identifiers: *Solid waste disposal, *Sanitary landfills.

The report gives the pros and cons of sanitary landfills versus incineration for municipal refuse disposal.

PB-217 442
Robert S. Kerr Water Research Center, Ada, Okla.
SOIL RESPONSE TO SEWAGE EFFLUENT IRRIGATION,
R. E. Thomas, and James P. Law, Jr. 1968, 22p
Prepared for presentation at the Symposium on the Use of Sewage Effluent for Irrigation, held at Louisiana Polytechnic Inst., Ruston, La. 30 Jul 68. Report on the Water Quality Control Research Program.

Descriptors: (*Sewage disposal, *Irrigation), Soil properties.
Identifiers: *Sewage irrigation.

The objective of the report paper is to summarize present knowledge of the treatment of waste water by applying it to the surface of the soil. Brief sections on the present use and design of soil systems and waste water quality are followed by a discussion of the interactions which result from the application of waste water to a plant ecosystem.

PB-217 443
Environmental Health Center, Cincinnati, Ohio.
RESEARCH STUDIES OF HOUSEHOLD SEWAGE DISPOSAL SYSTEMS,
James B. Coulter. 1951, 25p
Presented at the Conference with the Illinois Association of Precast Concrete Septic Tank Manufacturers, Springfield, Ill., 4 Dec 51.

Descriptors: (*Septic tanks, Research).

The discussion treats the studies under four general headings: first, Field Studies; second, Laboratory Septic Tank Experiments; third, Special Experiments; and fourth, Laboratory and Field Soil Studies.

PB-217 444
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ALUM ADDITION TO ACTIVATED SLUDGE WITH TERTIARY SOLIDS REMOVAL,
Alan B. Pi[illegible], John B. Stamberg, and Dolloff F. Bishop. Mar 71, 27p
Presented at the National Meeting of the AIChE (68th), Houston, Texas, March 1971.

Descriptors: (*Sewage treatment, Precipitation (Chemistry)), (*Alums, Sewage treatment), (*Phosphorus, *Chemical removal (Sewage treatment)), Pilot plants.
Identifiers: *Tertiary sewage treatment.

The report describes the pilot treatment of District of Columbia primary effluent consisting of four-stage step aeration, alum addition in the final aeration pass for phosphorus removal, secondary clarification and multi-media filtration for tertiary solids separation.

PB-217 445
National Environmental Research Center, Cincinnati, Ohio.
AUTOMATED ANALYSES FOR ENVIRONMENTAL POLLUTION CONTROL,
L. J. Kamphake, and R. T. Williams. Jun 72, 30p
Presented at the Technicon International Congress, New York, N.Y., June 12-14, 1972.

Descriptors: (*Water pollution, *Monitors), (*Water analysis, Monitors), Automation, Phosphorus, Nitrogen.
Identifiers: *Water pollution detection.

Techniques and development of automated analysis for parameters requiring wet-chemical methods, are presented. Also, their application is discussed for the continuous monitoring of waste waters and control of various treatment processes for nitrogen and phosphorus removal.

PB-217 446
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
BACTERIOLOGICAL EFFECTS OF PRIMARY TREATMENT PLANT DISCHARGES AT BREMERTON, WASHINGTON.

Jul 70, 63p

Descriptors: (*Water pollution, Puget Sound), (*Coliform bacteria, *Puget Sound), (*Washington (State), Water pollution), Sinclair Inlet, Port Washington Narrows, Biological surveys, Plumes.
Identifiers: *Sewage treatment effluent, *Bremerton (Washington).

The study determines the general background level and distribution of total coliform bacteria in the waters of Sinclair Inlet and Port Washington Narrows and the effect does the discharge of primary chlorinated effluent through shallow marine outfalls upon bacteriological water quality.

PB-217 447
Public Health Service, Denver, Colo. Region VIII.
WATER QUALITY CONTROL STUDY AND PUBLIC HEALTH ASPECTS OF THE UPALCO UNIT, CENTRAL UTAH PROJECT, UTAH.

Jun 65, 41p
Prepared at the request of and in cooperation with the Bureau of Reclamation, Salt Lake City, Utah. Region 4.

Descriptors: (*Lake Fork River, *Reservoirs), (*Utah, *Water resources), Forecasting.
Identifiers: *Duchesne County (Utah).

General objectives of the water quality control study are to assess the probable effects of the proposed project on water quality in local streams and reservoirs; to ascertain the benefits or harm resulting from changes in water quality; to assess the suitability of the water for proposed water uses; and to determine the need for and the value of storage for regulation of streamflow for the purpose of water quality control. The study covers Duchesne County in northeastern Utah. The need for streamflow regulation was studied not only for the present conditions, but also for anticipated future conditions in the year 2060. (Author)

PB-217 448
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
EUTROPHICATION PROBLEMS IN RESERVOIRS,
A. F. Bartsch. Jan 69, 10p
Proceedings of Seminar condected by Oregon State Univ. Water Resources Research Inst., Fall quarter, 1968.

Descriptors: (*Water pollution, Limnology), (*Reservoirs, *Limnology), Ecology.
Identifiers: *Eutrophication.

The report describes and discusses the problem of eutrophication, specifically as it affects reservoirs. Included are historical background, causes, biology, problems, and suggested remedies.

PB-217 449
Public Health Service, Denver, Colo. Region VIII.
WATER RESOURCES STUDY AND PUBLIC HEALTH ASPECTS OF THE CENTRAL UTAH PROJECT – BONNEVILLE UNIT, UTAH.

Jul 63, 75p
Prepared in cooperation with Bureau of Reclamation, Region 4, Salt Lake City, Utah. Revision of report dated Feb 63.

Descriptors: (*Reservoirs, Utah), (*Utah, *Water resources).
Identifiers: *Salt Lake County (Utah), *Utah County (Utah), *Juab County (Utah), *Wasatch County (Utah), *Duchesne County (Utah).

General objectives of this study are to assess the probable effects of project construction and operation on water quality in local streams and lakes; to ascertain the benefits or harm resulting from changes in water quality, and finally to examine the need for regulation of streamflow for the purpose of water quality control in the principal streams affected. Need for regulation of streamflow was studied not only in light of present conditions, but also under anticipated economic development of the years 1985, 2010, and 2060. Project developments will affect all or part of seven counties in north central Utah: Salt Lake, Utah, Juab, Wasatch, Duchesne, Summit, and Uintah.

PB-217 450
Public Health Service, Denver, Colo. Region VIII.
WATER RESOURCES STUDY AND PUBLIC HEALTH ASPECTS OF THE DALLAS CREEK PROJECT, COLORADO: STUDY OF POTENTIAL NEEDS AND VALUE OF STORAGE OF WATER FOR QUALITY CONTROL PURPOSES AND THE PUBLIC HEALTH ASPECTS OF THE PROJECT.

Oct 63, 71p

Descriptors: (*Uncompahgre River Basin, *Reservoirs), (*Colorado, *Water resources), Forecasting.

General objectives of the study are to assess the probable effects the proposed project will have on water quality in local streams and reservoirs; to ascertain the benefits or harm resulting from changes in water quality; to assess the suitability of the water for proposed water uses, and to examine the need for regulation of streamflow for the purpose of water quality control. Need for streamflow regulation was studied not only in light of present conditions, but also under anticipated economic development in the Uncompahgre River Basin of the years 1985, 2010, and 2060. The report includes the results of a study of general public health aspects and insect vector control of the project. A preliminary evaluation of the insect vector problems that may be associated with the project is presented.

PB-217 451
Federal Water Quality Administration, Chicago, Ill. Great Lakes Region.
CHEMISTRY LABORATORY MANUAL, BOTTOM SEDIMENTS COMPILED BY GREAT LAKES REGION COMMITTEE ON ANALYTICAL METHODS,
Frederic D. Fuller. Dec 69, 106p

Descriptors: (*Sediments, *Chemical analysis), Manuals.
Identifiers: *Water pollution detection.

Contents:
Introduction;
Chemical oxygen demand;
Cyanide;
Iron;
Metals;
Nitrogen;
Oil and grease;
Oxygen demand and chlorine demand;
Pesticides;
Phenol;
Phosphorus;
Solids;
Sulfide;
Silica;
Manganese;
Oxidation-reduction potential measurements.

PB-217 452
Pacific Northwest Water Lab., Corvallis, Oreg.
STUDY OF PULP AND PAPER MILL POLLUTION IN PUGET SOUND,
A. F. Bartsch. 1965, 23p
Pub. in Proceedings of the International Water Pollution Research Conference (2nd) Held in Tokyo (Japan) Aug 64, p43-64 1965.

Descriptors: (*Puget Sound, Water pollution), (*Water pollution, *Spent liquors (Pulping)), (*Paper industry, Water pollution), (*Washington (State), Water pollution), Biological surveys, Bioassay.
Identifiers: *Water pollution effects (Animals).

The report discusses a program under way since spring 1962. Among its several phases are field studies at four locations where seven pulp and paper mills discharge wastes into Washington's Puget Sound waters. Reported are the findings of essentially the first year's field research at Everett, Washington, one of the four study sites. Also identified problems encountered and new procedures found necessary. The program objective was to determine the effects of wastes from the pulp and paper mills on the marine environment and its harvestable resources.

PB-217 453
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
ADVANCES IN WASTEWATER TREATMENT, PILOT PLANT, POMONA, CALIF.

Feb 73, 19p

Descriptors: (*Sewage treatment, *Chemical removal (Sewage treatment)), Activated carbon treatment, Ion exchanging, Electrodialysis, Osmosis.
Identifiers: Denitrification, *Physical chemical treatment, *Pomona Sewage Treatment Plant.

The initial effort at the Pomona Advanced Waste Treatment Pilot Plant was directed toward developing technical and economic information on the granular carbon adsorption process for removing the dissolved organic contaminants (as measured by COD) remaining in the conventionally-treated wastewaters. Work on various modifications of the granular carbon adsorption process is continuing and the investigation of several other processes has been undertaken. In addition to carbon adsorption, the Pomona staff is working on ion exchange, electrodialysis, reverse osmosis, mineral addition to conventional processes to enhance phosphorus removal and biological denitrification.

PB-217 454
Public Health Service, Washington, D.C.
TRANSCRIPT OF CONFERENCE - POLLUTION OF INTERSTATE WATERS, MISSISSIPPI RIVER, ST. LOUIS METROPOLITAN AREA - HELD IN ST. LOUIS, MO., 4 MAR 58.

Apr 58, 140p

Descriptors: (*Mississippi River, *Water pollution), (*Illinois, Water pollution), (*Missouri, Water pollution), Proceedings.
Identifiers: *Saint Louis Metropolitan Area.

The purpose of the conference was to bring together the state and interstate water pollution control agencies, the localities concerned and industries and the Public Health Service to review the existing situation, the progress which has been made, and to lay a basis for future action by all parties concerned and to give the states and localities an opportunity to take any remedial action which may be indicated under state and local law.

PB-217 455
Chemical Separations Corp., Oak Ridge, Tenn.
NOVEL REGENERATION METHOD FOR ION EXCHANGE SYSTEMS.
Final rept.,
I. R. Higgins. 25 Jan 65, 61p
Contract PH-86-63-120

Descriptors: (*Sewage treatment, *Ion exchanging), Regeneration (Engineering), Performance evaluation, Process charting, Cost estimates.
Identifiers: *Tertiary sewage treatment.

The purpose of the study was to outline and demonstrate an ion exchange water treatment system made low cost through a system of recovering and reusing regenerants. The need of the study was to prove that nitrate salts can be conveniently dissociated into acid and base useful for regeneration of ion exchange resins. The scope of the study covered laboratory scale steam calcination studies of nitrate salts, and continuous ion exchange runs to show economics in regenerant use and minimum dilution inherent in a continuous counter-current flow system. (Author)

PB-217 456
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SEWAGE AND WATER WORKS CONSTRUCTION,
Donald A. E. Beer, and Elsie M. Gibson. 1959, 17p
PHS-Pub-758-1960

Descriptors: (*Sewage treatment, *Contracts), (*Water treatment, *Contracts), Inventories, Construction.
Identifiers: *Sewage treatment plants.

The contract award data presented in this publication for the year 1959 result from the careful examination of over 25,000 contract notifications in the sewage and water works construction and related fields. All notifications of similar contracts awarded in the same geographical area are checked to reduce the chance of duplication. Certain contracts, primarily those covering sewage treatment plants, are checked and verified by the various State water pollution control agencies.

PB-217 457
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
NATIONWIDE MANPOWER BACKLOG IN WASTEWATER TREATMENT PLANTS,
Frederick Bazeley. Aug 70, 25p

Descriptors: (*Sewage treatment, *Manpower).

Information from several sources on the wastewater treatment plant manpower backlog has been compared in order to determine whether sewage treatment facilities are adequately staffed. The purpose in combining the information from these sources was to compare the number of persons presently employed at wastewater treatment plant facilities with the number recommended for full operational effectiveness.

PB-217 458
Public Health Service, Dallas, Tex. Region VII.
BEAVER RESERVOIR STUDY. BENTON AND WASHINGTON COUNTIES, ARKANSAS.
Jun 59, 46p
Prepared in cooperation with Army Engineer District, Little Rock, Ark.

Descriptors: (*White River, *Reservoirs), (*Arkansas, *Water resources), Forecasting.
Identifiers: *Benton County (Arkansas), *Washington County (Arkansas).

The report is a study of the municipal and industrial water supply situation in Benton, and Washington Counties, Arkansas, in relation to the proposed Beaver Reservoir. The study is primarily based on economic grounds.

PB-217 459
Environmental Health Center, Cincinnati, Ohio.
DISPOSAL OF WASTES FROM THE CLEANING OF AIRPLANES.
Rept. no. 3,
L. R. Setter, A. S. Goldin, C. Henderson, and M. W. Carter. Jan 54, 39p
Contract AF-33 (038)-22425

Descriptors: (*Military air facilities, *Industrial wastes), (*Water pollution, Organic solvents), (*Industrial waste treatment, *Organic solvents), Aircraft, Cleaning, Cleaning agents.

The pollution characteristics, including fish toxicity, and the treatability of six airplane cleaning wastes from operations at the Lockbourne Air Force Base were investigated. The study involved the collection of waste samples, the determination of the pollutional characteristics of the wastes, the investigation of treatment methods necessary prior to discharge into the stream, and a determination of the toxicity to fish of the untreated and treated effluents. The information developed by this study is to be used as one factor in determining the suitability of the individual compounds for the cleaning of airplanes.

PB-217 461
Iowa State Univ., Ames, Engineering Research Inst.
FILTRATION RESISTANCE OF SEVERAL COMMERCIAL FILTER AIDS.
Final rept. (Part I),
E. Robert Baumann, Madan Lal Arora, and Charles S. Oulman. Jun 68, 222p ERI-217
Contract DAAK02-67-C-0408, Grant FWPCA-WP-00196

Descriptors: (*Filter aids, Properties), (*Filtration, Filter aids), Diatomaceous earth, Perlite, Performance evaluation.

The study determines and compares the hydraulic characteristics of several commercial diatomite and perlite filter aids, under conditions simulating military-type water filtration operations so that the results could be used to determine a filter aid specification for military purposes.

PB-217 462
Tucson Water and Sewers Dept., Ariz.
TUCSON WASTEWATER RECLAMATION PROJECT.
Annual rept. no. 1,
Paul Boermann, Gordon Emerson, and John Frank Stafford. Jul 66, 108p
Grant WPD-108-01-65

Descriptors: (*Sewage treatment, *Water reclamation), (*Water supply, *Arizona), Feasibility, Sand filtration, Pilot plants.
Identifiers: *Tucson (Arizona), *Waste water reuse.

The purpose of the report is to demonstrate the chemical, microbiological, and virological safety and the aesthetic acceptability of including renovated wastewater as a dependable and substantial portion of the future water supply for Metropolitan Tucson.

PB-217 463
Environmental Protection Agency, Washington, D.C.
OFFICE OF RADIATION PROGRAMS TRAINING MANUAL. MANAGEMENT OF RADIATION ACCIDENTS.

1970, 229p

Descriptors: (*Radiation hazards, *Reviews), (*Nuclear reactor accidents, Reviews), (*Radiobiology, Radiation hazards), (*Fallout, Radiation hazards), Radiation effects.

Contents:
Radiation fundamentals;
Radiation detection;
Radiation protection;
Sources of radioactivity;
(Sealed sources, Sealed sources in medicine, Sealed sources in industry, Basin principles of nuclear reactors, Nuclear detonations and fallout);
Radiation accidents, Radium accidents, Radioactive contamination monitoring, Emergency monitoring techniques for food and water, Introduction to reactor incidents, Causes, effects and control of reactor incidents, Fission product inventories;
Medical aspects of Radiation accidents.

PB-217 464
Public Health Service, Kansas City, Mo. Region VI.
STATEMENT, WATER POLLUTION CONTROL AND QUALITY MANAGEMENT PROGRAMS FOR IOWA, KANSAS, MISSOURI, AND NEBRASKA. VOLUME III. APPENDIX C - CONSTRUCTION GRANTS. APPENDIX D - ENFORCEMENT. APPENDIX E - FEDERAL INSTALLATIONS.
May 64, 244p
Presented before the Natural Resources and Power Subcommittee of the House Committee on Government Operations, Kansas City, Mo., May 22-23, 1964.

Descriptors: (*Iowa, Water pollution), (*Kansas, Water pollution), (*Missouri, Water pollution), (*Nebraska, Water pollutions), Grants, Law enforcement.

Gives tables of data on the construction projects and their total and government financed costs, summarizes hearings and conferences on where enforcement is needed, and gives the amount of daily waste disposal from Federal installations.

PB-217 465
Public Health Service, Washington, D.C. Div. of Sanitation.
REFUSE COLLECTION AND DISPOSAL. A BIBLIOGRAPHY. (1951 SUPPLEMENT),
Donald Keagy. 1951, 13p
Supplement to report dated 1950.

Descriptors: (*Waste disposal, *Bibliographies), Financing, Storage, Collection, Streets, Incineration, Earth fills, Grinding (Communication), Composts, Feeding stuffs.
Identifiers: *Solid waste disposal.

Contents: Regulations; Finances; Storage; Collection; Street cleaning; Disposal - (General; Incineration; Sanitary landfill and open dumps; Garbage grinding; Composting and reduction; Hog feeding; Salvage).

PB-217 466
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY CONSERVATION, ARKANSAS-RED RIVER BASINS APPENDIX. VOLUME II -WATER QUALITY DATA. PART 5. TRACE ELEMENTS ANALYSES, RADIOACTIVITY RECORD, INDEX TO TABULATIONS.

Mar 64, 230p
See also Volume 2, Part 2, PB-217 476.

Descriptors: (*Arkansas River Basin, *Water pollution), (*Red River Basin, *Water pollution), (*Colorado, Water pollution), (*Kansas, Water pollution), (*Oklahoma, Water pollution), (*Arkansas, Water pollution), (*Louisiana, Water pollution), Missouri, New Mexico, Trace elements, Radioactive contaminants.
Identifiers: *Water quality data.

The compilation of water quality data collected during the 27-month period of intensive study (July 1960 through September 1962) of the Arkansas-Red River Basins Water Quality Conservation Project is presented in five parts. These data were gathered to provide a basis for (1) location and definition of the significant natural and manmade sources of salt (mineral) pollution, and (2) determination of the effects of these sources on the quality of water in the receiving streams. This report is Part 5 of Volume 2 and discusses trace ele-

ments analyses; radioactivity record; and contains an index to tabulations.

PB-217 467
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Lab. of Engineering and Physical Sciences.
CHARACTERIZATION OF INDUSTRIAL FABRIC FILTERS,
George William Walsh, and Paul W. Spaite. 1960, 22p

Descriptors: (*Air pollution control equipment, *Gas filters), Performance evaluation, Gas flow.
Identifiers: *Fabric filters.

The report examines the systematic nonuniformities inherent in multicompartmented baghouse operation, and analyzes the over-all performance in relation to the characteristics of the individual compartments. Those properties of an operating unit which can be used to characterize the installation are delineated, and a methodology developed whereby critical values of these properties may be calculated from easily obtainable field measurements. The critical characteristics are defined as the residual filter drag of a compartment, the terminal filter drag of a compartment, and the residual velocity. The utility of these characteristics to determine the cause of operating difficulties is discussed. (Author Modified Abstract)

PB-217 468
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY CONSERVATION, ARKANSAS-RED RIVER BASINS. APPENDIX. VOLUME II. WATER QUALITY DATA. PART 4. STREAM UNIFORMITY STUDY DATA AND BASIS FOR CORRELATION OF SPECIFIC CONDUCTANCE AND CHEMICAL ANALYSES, RED RIVER BASIN.

Mar 64, 313p

Descriptors: (*Arkansas River Basin, *Water pollution), (*Red River Basin, *Water pollution), (*Oklahoma, Water pollution), (*Colorado, Water pollution), (*New Mexico, Water pollution), (*Arkansas, Water pollution), (*Louisiana, Water pollution).
Identifiers: *Water quality data.

The compilation of water quality data collected during the 27-month period of intensive study (July 1960 through September 1962) of the Arkansas-Red River Basins Water Quality Conservation Project is presented in five parts. These data were gathered to provide a basis for location and definition of the significant natural and manmade sources of salt (mineral) pollution, and determination of the effects of these sources on the quality of water in the receiving streams. The intensive investigation of water quality and natural sources of mineral pollution was limited to the central portions of both basins, the area in which major salt sources exist, and mineral pollution is most severe. (Author Modified Abstract)

PB-217 469
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
A STEADY STATE SEGMENTED ESTUARY MODEL,
Ronald E. Bunce, and Leo J. Hetling. 2 Jun 69, 201p CB-SRBP-Technical Paper-11

Descriptors: (*Estuaries, *Water pollution), (*Mathematical model, *Estuaries).

The purpose of the paper is to describe in detail the theory of the Thomann Model as applicable to the one-dimensional steady-state case of organic pollution of an estuary and to document a digital computer program developed to solve this case.

PB-217 470
Public Health Service, Portland, Oreg. Region IX.
PRELIMINARY INVESTIGATION OF MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND STREAM QUALITY CONTROL REQUIREMENTS ASSOCIATED WITH MULTI-PURPOSE RESERVOIR STUDIES IN THE WILLOW CREEK BASIN, OREGON.
21 Dec 61, 27p Working Paper-33
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willow Creek Basin, *Reservoirs), (*Oregon, *Water resources).

The report represents a preliminary examination of present and predicted future municipal and industrial water supply and stream quality control needs in the Willow Creek Basin. The objective of the study was to determine on a preliminary basis whether or not provisions for municipal and industrial water supply and/or low flow augmentation for stream quality control should be considered in the planning of the proposed reservoir. Studies involved Heppner, Oregon (population 1,660), located immediately below the proposed dam site, and Lexington, Oregon (population 240) and Iona, Oregon (population 350), situated approximately eight miles and seventeen miles downstream from Heppner, respectively.

PB-217 471
Public Health Service, Washington, D.C.
TRANSCRIPT OF HEARING: POLLUTION OF INTERSTATE WATERS, MISSOURI RIVER. VOLUME 2. HELD AT SIOUX CITY, IOWA ON 23-27 MARCH 1959.
1973, 278p

Descriptors: (*Missouri River, *Water pollution), (*Iowa, Water pollution), (*South Dakota, Water pollution), (*Nebraska, Water pollution), Proceedings.
Identifiers: *Sioux City (Iowa).

Presented is the transcript of a hearing on Missouri River pollution as it has affected fishing, public health, ecology, and recreation.

PB-217 472
California Univ., Berkeley. School of Public Health.
PARTIAL DEMINERALIZATION OF SALINE WASTES.
Progress rept. no. 3,
R. L. Sanks, and W. J. Kaufman. May 66, 21p
Grant FWPCA-WP-00544
Report on Partial Demineralization of Saline Sewage by Ion Exchange.

Descriptors: (*Sewage treatment, *Ion exchanging).
Identifiers: *Tertiary sewage treatment.

The purpose of the investigation was to ascertain the feasibility of using ion exchange for the removal of the mineral portion of the use increment in sewage prior to re-use. Specifically, (1) to optimize the operating variables of a strong acid cation-weak base anion exchange system for the partial demineralization of brackish waste water, (2) to develop a rational basis for the design of partial demineralization systems for municipal use, (3) to identify the limitations and the operational difficulties, and (4) to determine the economic feasibility of the process in comparison with other methods.

PB-217 473
California Univ., Berkeley. School of Public Health.
PARTIAL DEMINERALIZATION OF UNCONTAMINATED BRACKISH WATERS.
Progress rept. no. 2,
R. L. Sanks, and W. J. Kaufman. May 66, 47p
Grant FWPCA-WP-00544
Report on Partial Demineralization of Saline Sewage by Ion Exchange.

Descriptors: (*Desalting, *Ion exchanging), Brackish water, Cost estimates, Performance evaluation.

The broad objective of the study was to optimize the design and operating cycle of ion exchange systems for the specific purpose of demineralizing brackish waters for municipal use. As regenerant chemicals comprise a major item of cost in ion exchange demineralization, special emphasis was placed on ascertaining the most efficient exhaustion-regeneration cycle. Throughout the study advantage was gained by using the generally lower domestic criteria of mineral acceptability in comparison with the usual industrial requirements for low conductivity water.

PB-217 474
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WHAT CITIES ARE DOING ABOUT THEIR ODOR PROBLEMS,
Jean J. Schueneman. 1956, 12p
Presented at the Metropolitan Cincinnati Conference on Air Pollution Control: Odor Control, Cincinnati, Ohio. October 25, 1956.

Descriptors: (*Odor control, *Urban planning), (*Air pollution, *Odors).

The paper discusses a conference on odor control concerned with several aspects of the detection and control of odors and their relationship to community life.

PB-217 475
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SEWAGE DISPOSAL SYSTEMS APPLICABLE TO SUBDIVISIONS,
James B. Coulter. 23 Jan 57, 12p
Presented at the National Association of Home Builders Convention-Exposition Panel Discussion on Water and Sewerage Systems for Subdivisions, Chicago, Illinois, January 23, 1957.

Descriptors: (*Septic tanks, Communities), (*Sewage treatment, *Communities).

Subject discussed included: Individual household systems; Community systems; Lagoons; and the Anaerobic contact process.

PB-217 476
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY CONSERVATION, ARKANSAS-RED RIVER BASINS APPENDIX. VOLUME II - WATER QUALITY DATA. PART 2. CHEMICAL ANALYSES.
Mar 64, 348p
See also Volume 2, Part 5, PB-217 466.

Descriptors: (*Arkansas River Basin, *Water pollution), (*Red River Basin, *Water pollution), (*Colorado, Water pollution), (*Kansas, Water pollution), (*Oklahoma, Water pollution), (*Arkansas, Water pollution), (*Louisiana, Water pollution), Missouri, New Mexico.
Identifiers: *Water quality data.

The completion of water quality data collected during the 27-month period of intensive study (July 1960 through September 1962) of the Arkansas-Red River Basins Water Quality Conservation Project is presented in five parts. This report is Part 2 of Volume 2 and discusses the chemical analyses.

PB-217 477
Public Health Service, Washington, D.C.

A REPORT ON THE PUBLIC HEALTH ASPECTS OF CLAMMING IN RARITAN BAY,
Robert W. Kehr, Benjamin S. Levine, C. T. Butterfield, and Arthur P. Miller. 1941, 128p

Descriptors: (*Raritan Bay, *Water pollution), (*Clams, Raritan Bay), (*New Jersey, Water pollution), (*New York, Water pollution), Public health, Sources, Aquatic microbiology, Biological surveys, Fishing grounds.
Identifiers: *Water quality data.

During the summer of 1940 it was indicated that waters of the Raritan Bay area were of doubtful sanitary quality for the taking of clams. Therefore, a detailed survey was made and a standard defining the allowable limits of pollution within which the public health would not be endangered by the taking of clams from the area was formulated. The survey covered practically the entire period of April, May and June, 1941, and was made by three cooperating laboratories whose procedures were coordinated under the immediate direction and supervision of the U.S. Public Health Service.

PB-217 478
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
QUARTERLY PROGRESS REPORT, JULY 1--SEPTEMBER 30, 1969.

Oct 69, 48p
See also report dated Jan 70, PB-217 479.

Descriptors: (*Water pollution, Research).
Identifiers: *Pacific Northwest Water Laboratory.

Contents: National thermal pollution; National coastal pollution; National eutrophication; Waste treatment research; Biological effects; Consolidated laboratory services; and Training and manpower development.

PB-217 479
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
QUARTERLY PROGRESS REPORT, OCTOBER 1-DECEMBER 31, 1969.

Jan 70, 47p
See also report dated Apr 70, PB-217 480.

Descriptors: (*Water pollution, Research).
Identifiers: *Pacific Northwest Water Laboratory.

Contents: Office of laboratory director; National coastal pollution; National eutrophication research; Waste treatment research; National thermal pollution; Biological effects; Consolidated laboratory services; and Training and manpower development.

PB-217 480
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
QUARTERLY PROGRESS REPORT, JANUARY 1-MARCH 31, 1970.

Apr 70, 48p
See also report dated Jun 70, PB-217 481.

Descriptors: (*Water pollution, Research).
Identifiers: *Pacific Northwest Water Laboratory.

Contents: Office of laboratory director; National eutrophication; Waste treatment research; National thermal pollution; National coastal pollution; Biological effects; Consolidated laboratory services; and Training and manpower development.

PB-217 481
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
QUARTERLY PROGRESS REPORT, APRIL 1--JUNE 30, 1970.

Jun 70, 41p
See also report dated Oct 70, PB-217 482.

Descriptors: (*Water pollution, Research).
Identifiers: *Pacific Northwest Water Laboratory.

Contents: National coastal pollution; National eutrophication; National waste treatment research; National thermal pollution; Biological effects; Consolidated laboratory services; and Training and manpower development.

PB-217 482
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
QUARTERLY PROGRESS REPORT, JULY 1--SEPTEMBER 30, 1970.

Oct 70, 45p
See also report dated Jun 70, PB-217 481.

Descriptors: (*Water pollution, Research).
Identifiers: *Pacific Northwest Water Laboratory.

Contents: National thermal pollution; National coastal pollution; National eutrophication; National waste treatment; Consolidated laboratory services; and Training and manpower development.

PB-217 483
Vanderbilt Univ., Nashville, Tenn. Dept. of Environmental and Water Resources Engineering.
TRACING POLLUTED RESERVOIR INFLOWS WITH FLUORESCENT DYES.
Technical rept.,
Michael W. Morris, and Edward L. Thackston.
May 69, 56p TR-18

Descriptors: (*Reservoirs, *Tracer studies), Stream flow, Hydraulic models, Stratification.

The flow patterns and mixing, or dispersing, characteristics of storage impoundments must be investigated to determine the effects of the reservoirs on water quality and to determine the methods of operating, or controlling, the reservoirs to produce the highest water quality. The most promising methods for studying the mixing characteristics and flow patterns of reservoirs entails the use of a conservative or semiconservative tracer. Furthermore, the fluorescent tracers appear to be the most practical for these studies. It is the purpose of the investigation to demonstrate the usefulness of these tracers.

PB-217 484
Public Health Service, Portland, Oreg. Region IX.
STREAM TEMPERATURE PREDICTION METHODOLOGY,
J. Seaders. Mar 64, 18p Working Paper-46
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Stream pollution, Heat), (*Stream flow, Heat flux), (*Water pollution, Heat), Heat budget, Mathematical models.
Identifiers: *Thermal pollution.

The purpose of this report is to describe the methods used to find the increase in river water temperature as a parcel of water moves downstream. The elements of the problem are: (1) the mass of water affected in a given time period; (2) the energy input per unit of area for this period; (3) the exposed area of the water surface. The problem is to find the value of area and energy input for a given set of weather and discharge conditions. The subject will be solved in parts as follows: Development of energy budget table and its application; Development of travel time curves for constant discharges; and Development of exposure area curves for constant discharges.

PB-217 485
Public Health Service, Washington, D. C.
REFUSE COLLECTION AND DISPOSAL: A BIBLIOGRAPHY, 1941-1950.
Bibliography series,
Ralph J. Van Derwerker, and Leo Weaver. Jul 51, 95p PHS-Pub-91, PHS-BS-4

Descriptors: (*Waste disposal, *Bibliographies), Regulations, Financing, Storage, Collection, Streets, Cleaning, Incinerators, Earth fills, Grinding (Comminution), Composts, Feeding stuffs, Materials recovery, Utilization.
Identifiers: *Solid waste disposal.

Contents: Regulations; Finances; Storage; Collection; Street cleaning; Disposal (General; Incineration; Sanitary Landfill and Open Dumps; Garbage Grinding; Composting and Reduction; Hog feeding; Salvage).

PB-217 486
Federal Water Pollution Control Administration, Cincinnati, Ohio.
DETERMINATION OF MINE WASTE ACIDITY,
B. V. Salotto, E. F. Barth, M. B. Ettinger, and W. E. Tolliver. Jan 67, 27p

Descriptors: (*Mine waters, *Acidity), (*Water pollution, Mine waters), Water analysis, Hydrogen peroxide, Oxidation, Iron.
Identifiers: *Mine acid drainage.

Pollution from acid mine drainage is a chronic problem. The current vigorous interest has led to a re-examination of the methods of measuring total acidity, which are clearly based on the limited laboratory capabilities of prior years. Defined acid-metal mixtures containing iron (III), aluminum (III), iron (II), and hydrogen ion were reacted with sodium hydroxide under varying titration conditions. Results showed that at 25C a reliable measure of the total acidity can be obtained by oxidizing iron (II) with hydrogen peroxide and stopping the titration at pH 7.3. Hydroloysis of Fe (III) and Al (III) was complete at pH 7.3 before formation of aluminate ion. Positive interference due to manganese and hardness can be held to a minimum by proper selection of sample volume. Acidity due to carbon dioxide is easily removed by aeration. The procedure was applied to the analysis of acid mine sample with added standards with recoveries of 98 to 103%. (Author)

PB-217 487
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
DETERMINING THE BACTERIOLOGICAL QUALITY OF DRINKING WATER,
J. K. Hoskins, and C. T. Butterfield. 1935, 11p
Presented at Annual Convention of American Water Works Association, Cincinnati, Ohio, May 6-10, 1935.

Descriptors: (*Water supply, Bacteria), (*Potable water, Water analysis), (*Water analysis, *Bacteria).
Identifiers: *Water pollution detection.

It is concluded that the dilution tube method connot result in an accurate enumeration of coliaerogenes organisms and that, therefore, the need for an acceptable and dependable method still remains.

PB-217 488
Florida Univ., Gainesville. Inst. of Food and Agricultural Sciences.
STUDIES ON THE METHANOGENIC BACTERIA IN SLUDGE.
Summary progress rept.,
P. H. Smith. 31 May 68, 21p
Grant FWPCA-WP-00198-08

Descriptors: (*Sewage treatment, Anaerobic processes), (*Anaerobic processes, Process variables), (*Fermentation, *Metabolism), Nutrients, Digestion (Decomposition).

Identifiers: *Methane bacteria.

The objective of the project has been to quantitatively define the intermediate molecules preceding methane formation during sludge digestion. The assumption is made that if these intermediates are clearly defined the factors influencing their rates of metabolism can then be investigated, and that understanding of factors influencing these rates should suggest methods for controlling and increasing the rate of anaerobic digestion processes. The contribution of various intermediates as precursors of methane have been investigated using methods similar to those previously described by the principal investigator.

PB-217 489
Public Health Service, Portland, Oreg. Region IX.
PORTLAND HARBOR SURVEYS, LOWER WILLAMETTE RIVER, SUMMER 1961.

1961, 29p Working Paper-25
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River, *Water pollution), (*Oregon, Water pollution), Portland Harbor.
Identifiers: *Portland (Oregon), *Water quality data.

During the summer of 1961, the Public Health Service and Oregon State Sanitary Authority cooperated in several water quality surveys on the lower Willamette River downstream of Oregon City. Sampling station locations were midstream at No. 1 - SP and S Bridge (R.M. 7.0); No. 2 - Steel Bridge (R.M. 12.0); No. 3 - Staff Jennings (R.M. 16.5). The three stations were sampled every two hours at midstream for a 24-hour period. Measurements were made at the surface, mid-depth, and bottom 1/ of dissolved oxygen, biochemical oxygen demand, sulfite waste liquor, pH, and temperature. The BOD and SWL were sampled at mid-depth only. River stage data was made available by the U. S. Weather Bureau which operates a recording water level gage in the Portland Harbor.

PB-217 490
Vanderbilt Univ., Nashville, Tenn. Dept. of Environmental and Water Resources Engineering.
TURBULENT DIFFUSION AND REAERATION IN NATURAL RIVERS.
Progress rept. 1 Jun 68-31 May 69,
Peter A. Krenkel. 15 Apr 69, 16p
Grant WPD-168-02-68

Descriptors: (*Stream flow, *Turbulent diffusion), (*Reservoirs, *Tracer studies), Stratification, Dissolved gases, Oxygen.

The project was designed to demonstrate the feasibility of using refined tracer techniques to measure mixing and diffusion taking place under non-steady, non-uniform flow conditions. Specifically, the test demonstrated the feasibility of using fluorescent dyes to trace polluted water, traveling as a power wave, into and through a stratified impoundment. Measurements of longitudinal, lateral, and vertical mixing were made to demonstrate the feasibility and ease of this technique in determining mixing coefficients, which can be used to predict the spread of polluted inflows in a stratified environment.

PB-217 553
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... IDAHO.
Sep 58, 7p

Descriptors: (*Water pollution, *Legislation), (*Idaho, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as mining operations, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 554
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... NORTH CAROLINA.
Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*North Carolina, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, food crop irrigation, watershed development, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 555
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... COLORADO.
Sep 58, 10p

Descriptors: (*Water pollution, *Legislation), (*Colorado, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as mining operations, dam construction, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 556
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... CALIFORNIA.
Sep 58, 30p

Descriptors: (*Water pollution, *Legislation), (*California, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, ocean protection, fishing, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 557
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... IOWA.
Sep 58, 8p

Descriptors: (*Water pollution, *Legislation), (*Iowa, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, fishing food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 558
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... INDIANA.
Sep 58, 9p

Descriptors: (*Water pollution, *Legislation), (*Indiana, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, slaughterhouses food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 559
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... ARKANSAS.
Sep 58, 16p

Descriptors: (*Water pollution, *Legislation), (*Arkansas, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as game and fish conservation, recreational facilities, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 560
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... ARIZONA.
Sep 58, 9p

Descriptors: (*Water pollution, *Legislation), (*Arizona, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, smelter

operations, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 561
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... ALASKA.
Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*Alaska, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, fish and wildlife protection, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 562
Federal Water Quality Administration, Portland, Oreg. Northwest Region.
LOWER COLUMBIA RIVER TRANSECT STUDY. STATION NO. 403010, OCTOBER 29, AND 30, 1969. APRIL 21, AND 22, 1970,
William B. Schmidt. Oct 70, 26p Working Paper-79

Descriptors: (*Columbia River, *Water pollution), (*Oregon, Water pollution), Tables (Data).
Identifiers: *Water quality data.

The Federal Water Quality Administration (FWQA), Pollution Surveillance Branch, maintains a system of water quality sampling stations on interstate waters in the Northwest Region. Throughout the year water samples are collected at these stations and analyzed, and the data are used to evaluate water quality. This study documents conditions in 1969 and 1970 at Station No. 403010 located on the Columbia River at river mile 38.9 near Bradwood, Oregon.

PB-217 563
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
DISPOSAL OF INDUSTRIAL WASTES BY LAGOONING,
Robert B. Dean. Apr 69, 11p

Descriptors: (*Industrial waste treatment, *Lagoons (Ponds)).
Identifiers: *Aeration ponds.

Lagoons for industrial wastes have developed out of simple holding pits to contain solids and remove water by evaporation, infiltration, or overflow. The eventual failure of such lagoons has led to more sophisticated management of various types. Lagoons are used to provide one or more of the following treatments: mixing and equalization of loads, clarification and retention of solids, de watering, chemical neutralization or conversion, and removal of biologically active materials. Each of these functions is discussed with emphasis on the ultimate fate of the materials that have been placed into the lagoon. (Author)

PB-217 564
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
STORAGE OF VAPORS AND GASES IN PLASTIC BAGS,
A. P. Altshuller, A. F. Wartburg, I. R. Coben, and S. F. Sleva. 1961, 13p

Descriptors: (*Gas storage, *Bags), Permeability, Thermal stability.
Identifiers: Plastic bags.

The report describes investigations on the stability of a number of substances in the 0.1 to 1000 ppm range stored for several hours to several days in 'Mylar' and 'Scotchpak' bags. The compounds investigated most include numerous olefins, formaldehyde, acrolein, ozone, nitrogen dioxide, and sulfur dioxide. Many other substances, including aromatic hydrocarbons, phenols, crotonaldehyde, and alcohols, have been used in these bags but only qualitative or semi-quantitative information was obtained on their stability. Data also have been obtained on the stability of olefins, formaldehyde, acrolein, and nitrogen dioxide in samples of automobile exhaust effluents and diluted irradiated automobile exhaust stored in plastic bags.

PB-217 565
Public Health Service, Portland, Oreg. Region IX.
COLUMBIA RIVER BASIN PROJECT, HALSEY, OREGON. PRELIMINARY ESTIMATE OF ECONOMIC GROWTH, 1960-2010.

14 Aug 62, 6p Working Paper-28
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River Basin, *Economic development), (*Oregon, Economic development), Forecasting.
Identifiers: *Halsey (Oregon).

The report includes a preliminary estimate of the economic growth potential for Halsey, Oregon and the adjacent area for a 50 year period 1960-2010. The purpose of the study is for water supply and water quality management for the Columbia River Basin.

PB-217 566
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
MUNICIPAL AND INDUSTRIAL WASTE FACILITIES. 1957 INVENTORY. VOLUME 5. REGION V--ILLINOIS, INDIANA, MICHIGAN, OHIO, WISCONSIN.

1958, 344p PHS-Pub-622-Vol-5
A Cooperative State-Federal Report.

Descriptors: (*Sewage treatment, *Water pollution), (*Industrial waste treatment, *Water pollution), (*Illinois, Water pollution), (*Indiana, Water pollution), (*Michigan, Water pollution), (*Ohio, Water pollution), (*Wisconsin, Water pollution), Inventories, Tables (Data).

The inventory contains the latest available data for all sources of pollution, both municipal and industrial, which are of significance in water pollution control programs.

PB-217 567
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME I. SUMMARY REPORT.
10 Jan 68, 48p
See also Volume 3, PB-217 585.

Descriptors: (*Sewage treatment, *Cost analysis), (*Industrial waste treatment, *Cost analysis), Investments, Water pollution.
Identifiers: *Water pollution control, Thermal pollution.

The report presents initial estimates of the national requirements for and the cost of treating municipal, industrial, and other effluent during Federal Year 1969-1973 to meet water quality standards established under the Act, and comparable levels for intrastate and coastal waters.

PB-217 568
Environmental Health Center, Cincinnati, Ohio.
LIMITATIONS IN THE USE OF THE END-WINDOW COUNTER IN THE ASSAYING OF STREAM WATERS FOR BETA RADIOACTIVITY,
L. R. Setter, J. S. Nader, and G. R. Hagee. Sep 52, 21p

Descriptors: (*Water analysis, *Beta particles), (*Radiation measuring instruments, Beta particles), (*Radioactive contaminants, Water analysis).
Identifiers: *Water pollution detection.

Stream water to be assayed for beta radioactivity will have natural radioactivity with or without artificial radioactivity. The principle source of natural radioactivity is from K40 and from uranium, thorium and their daughter products. The artificial radioactivity will be the result of contamination from (a) the disposal of radioactive wastes, (b) fall-out from a contaminated atmosphere, and (c) the use of stream waters by atomic energy installations. The paper discusses the use of the end-window counter for the assay of the absolute beta radioactivity of stream water, its limitations, and the necessary corrections.

PB-217 569
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY TAR RIVER BASIN NORTH CAROLINA.

Dec 67, 49p

Descriptors: (*Tar River Basin, *Economic development), (*North Carolina, Economic development), River basin development, Forecasting.

The objectives of the study were to determine the economic growth and to evaluate the need for and value of storage for water supply and quality control for the Tar River Basin. The study area consists of the entire Tar drainage basin, which includes all or parts of eleven counties of North Carolina. The period of study covers the present and the 50-year period commending in 1975, and extending to 2025. The needs for water supply and quality control storage were determined for the years of 1980, 2000, and 2025.

PB-217 570
Sanitary Engineering Center, Cincinnati, Ohio.
DISCUSSION ON MOST PROBABLE NUMBERS IN SANITARY BACTERIOLOGY,
V. G. MacKenzie. Apr 49, 12p

Descriptors: (*Water analysis, *Coliform bacteria), (*Water pollution, Coliform bacteria).
Identifiers: *Water pollution detection.

The report compares methods of estimating densities of coliform bacteria in water samples and gives an explanation of the most probable number method.

PB-217 571
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SELECTED REFERENCES ON WASTE STABILIZATION PONDS,
William Marcus Ingram, W. W. Towne, and William Bliss Horning, II. Aug 60, 9p

Descriptors: (*Sewage treatment, Lagoons (Ponds)), (*Bibliographies, *Lagoons (Ponds)).
Identifiers: *Aeration ponds.

The references cited here are pertinent in their relationship to the successful development of functional waste stabilization ponds or lagoons which treat domestic sewage in the United States.

PB-217 572
Environmental Health Center, Cincinnati, Ohio.
SURVEY OF LITERATURE RELATING TO ATMOSPHERIC POLLENS AND HAY FEVER,
John S. Wiley. Jan 50, 42p

Descriptors: (*Pollen, *Hay fever), (*Air pollution, Pollen), Allergic diseases, Aerobiology, Plants (Botany), Bacteria, Reviews.

Preliminary to the inauguration of research work on atmospheric sampling for the determination of ragweed pollen concentrations, a cursory survey of the literature on pollens and hay fever was made. Even through this survey is far from complete it might serve as a source of information for those interested in this subject. Because of the similarity of sampling and counting procedures for the determination of air-borne pollens and bacteria, and in view of the trend toward additional research in bacterial air contamination, a number of the following references pertain largely to bacterial air sampling. Abstracts have been prepared of a number of the references cited. (Author Modified Abstract)

PB-217 573
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SEWAGE STABILIZATION PONDS IN THE DAKOTAS. VOLUME II (APPENDICES).
1957, 119p
A Joint Report with the North and South Dakota Departments of Health.

Descriptors: (*Sewage treatment, *Lagoons (Ponds)), (*North Dakota, Lagoons (Ponds)), (*South Dakota, Lagoons (Ponds)).
Identifiers: *Aeration ponds.

An evaluation was made of the use of stabilization ponds as a method of sewage disposal in cold climates. The contents include: Pertinent information on five ponds subjected to seasonal investigation; Field observations; Laboratory analyses; Winter-spring transition at six ponds in North Dakota; Descriptive data on all Dakota ponds constructed to June 1956.

PB-217 574
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... ILLINOIS.

Sep 58, 10p

Descriptors: (*Water pollution, *Legislation), (*Illinois, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, fishing, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 575
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... OREGON.
Sep 58, 9p

Descriptors: (*Water pollution, *Legislation), (*Oregon, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, wildlife conservation, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 576
Public Health Service, Washington, D.C.
DIGEST OF POLLUTION CONTROL LEGISLATION ... HAWAII.
Sep 58, 7p

Descriptors: (*Water pollution, *Legislation), (*Hawaii, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fishing grounds, food crop irrigation and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 577
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... DELAWARE.
Sep 58, 10p

Descriptors: (*Water pollution, *Legislation), (*Delaware, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fish protection and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 578
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... FLORIDA.
Sep 58, 10p

Descriptors: (*Water pollution, *Legislation), (*Florida, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as tidal waters, hyacinth control, and the protection of streams and underground water; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 579
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ...DISTRICT OF COLUMBIA.
Sep 58, 5p

Descriptors: (*Water pollution, *Legislation), (*District of Columbia, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as calcareous material disposal, and the protection of streams; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 580
Public Health Service, Washington, D.C.
DISTRICT OF WATER POLLUTION CONTROL LEGISLATION ...CONNECTICUT.
Sep 58, 12p

Descriptors: (*Water pollution, *Legislation), (*Connecticut, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as ice supply, fish protection; and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 581
Environmental Health Center, Cincinnati, Ohio.
FORD MORTOR COMPANY BY-PRODUCT COKE PLANT, DEARBORN, MICHIGAN, JUNE 20-22, 1951.
Industrial waste survey rept. 30 Oct-8 Nov 51.
1951, 48P

Descriptors: (*Rouge River, *Water pollution), (*Coking, Water pollution), (*Michigan, Water pollution), Phenols, Cyanides, Industrial waste treatment.
Identifiers: *Water quality data.

Representatives of the Ford Motor Company, Michigan Water Resources Commission, and the U. S. Public Health Service, met on May 29, 1951, at the Rouge Plant offices of the Ford Motor Company to discuss extensive improvements, recently completed by the Ford Motor Company, which substantially reduce wastes discharged from the by-product coke plant through the tailrace outlet in the Rouge River. The present survey resulted.

PB-217 582
Environmental Health Center, Cincinnati, Ohio.
FUNDAMENTALS GOVERNING SEPTIC TANK DESIGN AND INSTALLATION,
V. G. MacKenzie. 1950, 19p
Presented at the Inservice Training Course for Plumbing Problems at the 16 Sep 50, Ann Arbor, Mich.

Descriptors: (*Septic tanks, Design).

The report describes design criteria and suggested standards for the installation and maintenance of household sewage disposal systems.

PB-217 583
South Tahoe Public Utility District, South Lake Tahoe, Calif.
RECOVERY OF COAGULANT, NITROGEN REMOVAL, AND CARBON REGENERATION IN WASTE WATER RECLAMATION.
Final rept., 1 Apr 65-14 Jun 67,

David W. Callahan, Russell L. Culp, Clinton E. Smith, and Robert L. Chapman. Jun 67, 204p

Descriptors: (*Sewage treatment, *Water reclamation), (*Lake Tahoe, Sewage treatment), Chemical removal (Sewage treatment), Coagulation, Activated carbon treatment, Alums, Calcium oxides, Nitrification, Ion exchanging.
Identifiers: *Tertiary sewage treatment, *Denitrification, Ammonia stripping.

The report summarizes 26 months of work in waste water reclamation at the South Tahoe Public Utility District plant, South Lake Tahoe, California. The purpose of the project was to evaluate the performance of the operating, advanced waste treatment plant, which included conventional biological treatment and anaerobic sludge digestion, as supplemented by chemical coagulation, mixed-media filtration, and activated carbon adsorption, with particular attention to the regeneration and reuse of granular activated carbon. In addition, investigations were to be made of coagulant recovery and reuse, and removal from the waste waters of the biological nutrients – phosphorus and nitrogen. Information gained during the studies was to be used in the proposed expansion of the plant to a total capacity of 7.5 mgd.

PB-217 584
Federal Water Pollution Control Administration, Metuchen, N. J. Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project.
REPORT ON POLLUTION OF THE NAVIGABLE WATERS OF EASTERN NEW JERSEY, SHARK RIVER TO CAPE MAY.

May 67, 53p

Descriptors: (*Atlantic Ocean, Water pollution), (*New Jersey, *Water pollution), Coasts.

The study area extends from Shark River on the north to Cape May on the south, and embraces the navigable estuaries and tributaries of the Atlantic Coastal Area of New Jersey. It includes Shark River and inlet, Manasquan River and inlet, the Intracoastal Waterway, and the various bays, harbors, and streams tributary to the waterway. The study waters have a surface area of more than 115,000 acres. Municipal and institutional waste discharges constitute the greatest source of pollution within the New Jersey coastal basin. A recent Federal Water Pollution Control Administration survey of municipal and institutional wastes discharged into the New Jersey Coastal Basin between Shark River and Cape May found that: 23 sources discharge directly into the Atlantic Ocean, 30 discharge directly into the estuary (shellfish waters), 23, including three Federal installations, discharge to tributary streams. The report summarizes information regarding these waste sources.

PB-217 585
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. INDUSTRIAL WASTE PROFILE NO. 4 TEXTILE MILL PRODUCTS.
Sep 67, 153p
See also Volume 1, PB-217 567.

Descriptors: (*Textile industry, *Industrial waste treatment), (*Cost analysis, Industrial waste treatment).
Identifiers: *Water pollution control.

The Industrial Waste Profile is divided into three major sections. The first section surveys the Wool Textile Weaving and Finishing Industry; the second section, the Cotton textile Finishing Industry; and the third section, the Synthetic textile Finishing Industry. All of these industries are complex, variable, and in constant transition. As research and development provide new chemicals, processes, machinery, and techniques, and as consumer demand for types of fabric and color varies, the wastes generated by the industry change also. For this reason, the study has emphasized the principal types of textiles produced. For the purposes of this study, it is important to differentiate between the finishing process and the textile operations preceding it. Except for the scouring of raw wool, the making of raw fiber into unfinished cloth or yarn is essentially a dry operation. The finishing operation is a large producer of liquid wastes, however, and is the segment of the industry which concerns us.

PB-217 586
Department of Health, Education and Welfare, Washington, D.C.
PROCEEDINGS: ANNUAL CONFERENCE OF THE SURGEON GENERAL PUBLIC HEALTH SERVICE AND CHIEF, CHILDREN'S BUREAU WITH STATE AND TERRITORIAL HEALTH OFFICIALS, STATE MENTAL HEALTH AUTHORITIES AND REPRESENTATIVES OF STATE HOSPITAL SURVEY AND CONSTRUCTION AGENCIES (51ST) HELD AT WASHINGTON, D.C. ON 8-11 DECEMBER 1952.

1953, 83p PHS-Pub-307

Descriptors: (*Public health, *Meetings).

Contents:
Partners in health;
Address;
Report on the nation's health programs;
New development in use of gamma globulin in poliomyelitis;
The psychiatrist's role in the diagnosis and treatment of the delinquent child;
Radiological health protection;
The new environmental health center;
Need for re-enactment of public law 779;
Operation of public law 779;
Staffing of international programs;
Committee recommendations.

PB-217 588
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SEWAGE STABILIZATION PONDS IN THE DAKOTAS: AN EVALUATION OF THE USE OF STABILIZATION PONDS AS A METHOD OF SEWAGE DISPOSAL IN COLD CLIMATES. VOLUME I.
1967, 109p

Descriptors: (*Sewage disposal, Lagoons (Ponds)), (*Lagoons (Ponds), Cold weather tests), North Dakota, South Dakota.
Identifiers: *Aeration ponds.

A field investigation of sewage stabilization ponds in the Dakotas was conducted during the winter, spring, summer, and autumn of 1955, and winter-spring transition period of 1956. Physical, chemical and biological phenomena were observed and correlated with structural design, operational practice and climatological features. The report describes results obtained from the investigation.

PB-217 589
Environmental Health Center, Cincinnati, Ohio.
WATER QUALITY STUDIES: ROOSEVELT LAKE - WASHINGTON.

22 May 53, 52p

Descriptors: (*Roosevelt Lake, *Water pollution), (*Washington (State), Water pollution), (*Columbia River, *Water pollution), Reservoirs.
Identifiers: *Water quality data.

A study of the water quality characteristics and biological conditions in Roosevelt Lake was made during the period September 22 to October 1, 1952. Information from this reservoir, a high 'multiple purpose' type of impoundment with water depths up to 385 feet, would be expected to give data valuable in predicting effects of future Columbia River impoundments. Samples of water, plankton, bottom animals and fish were obtained at ten ranges throughout the reservoir to determine existing physical, chemical, bacteriological and biological characteristics. Radiological background information was obtained from some of these samples.

PB-217 591
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ...NORTH DAKOTA.

Sep 58, 7p

Descriptors: (*Water pollution, *Legislation), (*North Dakota, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, animal husbandry, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 592
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ...OHIO.
Sep 58, 10p

Descriptors: (*Water pollution, *Legislation), (*Ohio, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, mining, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 593
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
THE 1957 INVENTORY MUNICIPAL AND INDUSTRIAL WASTE FACILITIES. VOLUME 4. REGION IV. ALABAMA, FLORIDA, GEORGIA, MISSISSIPPI, SOUTH CAROLINA, TENNESSEE.
1958, 165p PHS-Pub-622

Descriptors: (*Sewage treatment, *Inventories), (*Industrial waste treatment, *Inventories), Alabama, Florida, Georgia, Mississippi, South Carolina, Tennessee.

The inventory contains the latest available data for all sources of pollution, both municipal and industrial, which are of significance in water pollution control programs. In the listing, each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Entries listed under the same community are alphabetized by name, under that community. Following the listing for each State there is a table showing those sewage disposal facilties which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-217 594
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
SEWAGE TREATMENT WORKS CONTRACT AWARDS 1952-1957,
William H. Abbott, and Lewis C. Hudson, Jr.
1957, 97p PHS-Pub-633

Descriptors: (*Sewage treatment, *Contracts), Inventories.
Identifiers: *Sewage treatment plants.

The report presents a general review of six years of sewage treatment words contract award data and includes detailed tables of the data.

PB-217 597
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ...OKLAHOMA.

Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*Oklahoma, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, community development, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practicws; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 598
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ...KENTUCKY.
Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*Kentucky, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as dead animal disposition, oil well operation, food crop irrigation, and the protection of steams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 599
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ...KANSAS.
Sep 58, 10p

Descriptors: (*Water pollution, *Legislation), (*Kansas, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establising of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, fishing, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority ig given to abate public nuisances by legal proceedings.

PB-217 600
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ...GEORGIA.
Sep 58, 13p

Descriptors: (*Water pollution, *Legislation), (*Georgia, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as shellfish protection, dead animal disposal, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 601
Syracuse Univ., N.Y. Dept. of Chemical Engineering and Metallurgy.
ATOMIZATION AND DROP SIZE OF NON-NEWTONIAN FLUID.
Final rept. 1 Sep 65-May 69,
K. H. Wang, Yoshisuke Nakano, and Chi Tien.
1969, 135p
Grant FWPCA-WP-00867

Descriptors: (*Atomizing, *Polymers), Rheology, Drops (Liquids).

The object of the investigation was to study the effect of various physical parameters on the drop size distribution formed in an atomization process for liquid with non-Newtonian rheological behavior. This study was motivated by the potential application of the Atomization Suspension Technique in ultimate disposal and the observation that suspensions and slurries often behave like non-Newtonian fluid. The principal findings are: The freezing technique is an account method of determining liquid drop sizes; The drop size distribution of non-Newtonian liquid can be described in terms of square-root normal distribution; and A stochastic model was successfully developed for the breakup mechanism in penumatic atomization. (Author Modified Abstract)

PB-217 602
Iowa State Univ., Ames. Engineering Research Inst.
USER MANUAL FOR MAIDS PROGRAM: PROGRAM FOR DETERMINATION OF BETA-PRDICTION EQUATIONS BY MANIPULATION AND INTERPRETATION OF DATA SYSTEMS,
Harold R. Bridges, and E. Robert Baumann. 15 Feb 68, 58p ERI-116
Contract DAAK02-67-C-0408, Grant FWPCA-WP-00196

Descriptors: (*Filter aids, *Computerized simulation), (*Filtration, Filter aids), Computer programs.

A study was undertaken to determine the characteristics of municipal applications in which filter aid filters may be used sucessfully, to study the effect of various variables on filtration economy and effectiveness, and to outline a procedure for designing a plant to operate with maximum economy. A digital computer program has been prepared to develop a filter cake resistance prediction equation from the results of several filter runs conducted with different levels of suspended solids and/or body feed. The paper describes in brief the required MAIDS Manipulation and interpretation of data systems) program listed in Fortran language, and describes its use with several examples.

PB-217 604
Public Health Service, Washington, D. C. Div. of Environmental Engineering and Food Protection.
PROCEDURES FOR TESTING PASTEURIZATION EQUIPMENT.
1966, 63p PHS-Pub-731
Paper copy available from GPO $0.25 as FS2.6/2:P26/2.

Descriptors: (*Pasteurizing, Equipment), Tests.

Contents:
- Tests of batch pasteurization equipment;
- Tests of high-temperature short-time pasteurization equipment;
- Additional tests when flavor control equipment is used in conjunction with high-temperature short-time pasteurization;
- Guidelines for inspection of batch pasteurization equipment;
- Guidelines for inspection of high-temperature short-time pasteurization equipment;
- Useful records and information.

PB-217 605
Federal Water Pollution Control Administration, Cincinnati, Ohio.
DISPOSAL TO THE ENVIRONMENT,
Robert B. Dean. 1968, 10p

Descriptors: (*Waste disposal, *Sewage treatment), Sludge disposal.
Identifiers: *Water pollution control.

Pollutants that are removed from wastewaters must be treated in such a way that they will not interfere with the intended use of the environment. The elements of polluting substances may be placed in the air, on or under the land, and in the oceans. Preliminary conversion to innocuous or nonextractable forms is necessary. The report reviews this problem. (Author Modified Abstract)

PB-217 606
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
WATER QUALITY AND POLLUTION CONTROL STUDY. JAMES RIVER BASIN.

Jun 67, 111p CB-SRBP-Working Document-14

Descriptors: (*James River Basin, *Water pollution), (*Virginia, Water pollution).

The document, by describing the immediate water pollution control action needed in the James River Basin, represents the first step in the development of a comprehensive program to control water pollution in the Basin. A biological study of the upper reaches of the James River and tributaries conducted by Chesapeake Bay-Susquehana River Basin Project comprised a special investigation to supplement sampling data of chemical and biochemical characteristics of water quality. Brief summaries of the biological studies are given, along with summaries of quality data, for most of the areas above Lynchburg, with more detailed descriptions of biological conditions outlined in the Appendix.

PB-217 607
Federal Water Pollution Control Administration, Philadelphia, Pa. Delaware Estuary Comprehensive Study.
PRELIMINARY REPORT AND FINDINGS.
Jul 66, 137p

Descriptors: (*Delaware Estuary, *Water pollution), New Jersey, Pennsylvania, Delaware.
Identifiers: *Water quality data.

For three generations pollution of the Delaware has been self-evident. However, up to now there has never been available a detailed analysis of that pollution; what it is, who is responsible for it, what might be done, and what it would cost to abate it. In 1957-58, at the request of the Corps of Engineers, the Public Health Service made a preliminary study of pollution in the Delaware Estuary. This in turn led to the making of the comprehen-

sive study covered by the report. The study was begun in 1961 by the Water Supply and Pollution Control Division of the Public Health Service, now the Federal Water Pollution Control Administration, at the request of the state and interstate pollution control agencies. This is a preliminary report of that study.

PB-217 608
Public Health Service, Kansas City, Mo. Region VI.
TRANSCRIPT OF HEARING: POLLUTION OF INTERSTATE WATERS. MISSOURI RIVER AND CONNECTING OR TRIBUTARY WATERS IN OR ADJACENT TO THE KANSAS CITYS METROPOLITAN AREA.

1960, 541p
Library of Congress Catalog Card No. 76-611621.

Descriptors: (*Missouri River, *Water pollution), (*Kansas, Water pollution), (*Missouri, Water pollution), Proceedings.
Identifiers: *Kansas City (Kansas), *Kansas City (Missouri).

This is a hearing on the pollution of the interstate waters of the Missouri and Kansas Rivers held upon order of the Secretary of Health, Education, and Welfare, the Honorable Arthur S. Flemming, and pursuant to due notice of the hearing given under the Federal Water Pollution Act and regulations. It was conducted on the basis of reports, surveys, and studies, that discharges of untreated or inadequately treated sewage and industrial wastes from the cities of Kansas City, Kansas, Kansas City, Missouri, and North Kansas City, Missouri, and industries associated therewith, cause or contribute to pollution subject to abatement under the Federal Water Pollution Control Act.

PB-217 610
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ...NEW JERSEY.

Sep 58, 12p

Descriptors: (*Water pollution, *Legislation), (*New Jersey, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oilwell operation, food crop irrigation, septic tanks, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 611
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION...MICHIGAN.
Sep 58, 9p

Descriptors: (*Water pollution, *Legislation), (*Michigan, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fish processing, oil well operation, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 612
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION...NEW MEXICO.
Sep 58, 6p

Descriptors: (*Water pollution, *Legislation), (*New Mexico, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as pipeline operation, food crop irrigation, dead animal disposition, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 619
Southeastern Radiological Health Lab., Montgomery, Ala.
INVESTIGATION OF TRITIATED LUMINOUS COMPOUNDS.
Final rept.
31 Mar 70, 22p
Sponsored in part by Army Mobility Equipment Research and Development Center, Fort Belvoir, Va.

Descriptors: (*Tritium compounds, *Radiation hazards), (*Industrial medicine, Tritium compounds), Radioactive isotopes, Absorption (Biology), Metabolism, Gastrointestinal system, Skin, Cats, Rats, Paints, Luminescence, Experimental data.

Radioactive luminous compounds represent a significant potential source of radiation exposure to both industrial workers and the general public. Luminous compounds with tritium as the activating agent are in relatively widespread usage in the painting of watch and instrument dials and in the production of radio-luminescent light sources. It is therefore desirable to have accurate information regarding the degree of uptake and the metabolic behavior of tritiated luminous compounds in general, and comparative data regarding the specific tritiated compounds now in use. In the present study the gastrointestinal (GI) tract and cutaneous absorptions of four commercially available tritiated luminous compounds were investigated. The cat was chosen as the experimental animal for studies of GI tract absorption because of the relative similarity of its GI system with that of the human. Cutaneous absorption of the tritiated compounds was studied in the rat.

PB-217 620
Federal Water Qaulity Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
SLUDGE PRESS CAKE INCINERATION IN A FLUOSOLID OVEN, BY H. BLANK, AND M. MAULAZ. DISCUSSION,
J. B. Farrell. 1970, 2p
Pub. in Proceedings of the 1970 National Incinerator Conference, Cincinnati, Ohio, May 1970 (ASME), p34-35 1970.

Descriptors: (*Sludge disposal, *Incinerators).

The report presents a discussion of an article on sludge cake incineration in a fluosolid oven.

PB-217 621
Southwestern Radiological Health Lab., Las Vegas, Nev.
LOW-LEVEL COUNTING BY LIQUID SCINTILLATION – II. APPLICATIONS OF EMULSIONS IN TRITIUM COUNTING,
A. A. Moghissi, and Robert Lieberman. 16 Oct 69, 9p
Prepared in cooperation with Southeastern Radiological Health Lab., Montgomery, Ala. Pub. in Internationa, Jnl. of Applied Radiation and Isotopes, v21 p319-327 1970.

Descriptors: (*Tritium, *Radiation measuring instruments), (*Scintillation counters, Tritium), Emulsions, Detergents.

The evaluation of numerous detergents for application in low-level liquid scintillation counting of tritium in an emulsion system is presented. In a typical operating mode of the selected system having a background of 9 counts/min above background corresponds to 200 pCi/l. of water. This increased sensitivity is achieved by the application of a new detergent Triton N101. The described system is stable and reproducible.

PB-217 622
Tucson Water and Sewers Dept., Ariz.
TUCSON WASTEWATER RECLAMATION PROJECT AT TUCSON, ARIZONA.
Annual progress rept. 1967-1968,
Frank Brooks. May 68, 182p
Grant WPD-108-03-67
Prepared in cooperation with Arizona Univ., Tucson. See also PB-217 462.

Descriptors: (*Trickling filtration, *Sewage treatment), Arizona, Pilot plants.
Identifiers: *Tucson (Arizona).

The report summarizes the work actually performed since the completion of the Pilot Filter facility in June of 1966 to April of 1968. Included is the assimilation, interpretation, graphic reproduction, tabulation, and re-evaluation by the Planning and Research Section of the of the City of Tucson.

PB-217 623
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL FOR THE MISSISSIPPI-WAPSIPINICON AND TRIBUTARIES RIVERS BASIN DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES, OF ILLINOIS, IOWA, MINNESOTA, AND WISCONSIN.
Water pollution series.

1953, 50P PHS-Pub-347, PHS-WPS-62

Descriptors: (*Mississippi River Basin, *Water pollution), (*Wapsipinicon River Basin, *Water pollution), (*Illinois, Water pollution), (*Iowa, Water pollution), (*Minnesota, Water pollution), (*Wisconsin, Water pollution).

The report, prepared in cooperation with the water pollution control agencies of Iowa, Illinois, Minnesota, and Wisconsin, sets forth the water pollution control program being followed by the respective States in the Mississippi-Wapsipinicon and Tributaries Rivers Basin. This program, which is based on data available as of July 1, 1953, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 624
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

PROTEIN CONTENT OF THE ATMOSPHERE.
Technical rept. Apr 53-Jul 55,
Leslie A. Chambers, Elbert C. Tabor, and Milton J. Foter. 1958, 45p SEC-TR-A58-9

Descriptors: (*Air pollution, *Proteins), United States.

As a part of the general air pollution program, a study was made of the protein content of the atmosphere. This may be of some importance in a study of allergens and indicative of certain sources of air pollution. Sampling stations were located at selected points throughout the continental United States and Alaska. The objectives of the investigation were: (1) development of an analytical method suitable for determining protein content in the presence of normal air contaminants; and (2) frequent air sampling to determine the variation of the protein concentration as a function of time and of height above ground.

PB-217 625
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
A CLIMATIC DIGEST FOR GREATER TULSA.
Technical rept.
Mar 58, 30p SEC-TR-A58-3

Descriptors: (*Oklahoma, *Air pollution), (*Microclimatology, Oklahoma).
Identifiers: *Tulsa (Oklahoma).

The climatic summary has been prepared mainly from records of weather observations taken at the Tulsa Municipal Airport by the United States Weather Bureau. It was prepared as part of a study to study the effects of the climate upon air pollution.

PB-217 626
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
LIME PRECIPITATION IN MUNICIPAL WASTEWATERS,
John B. Stamberg, Dolloff F. Bishop, H. Paul Warner, and Samuel H. Griggs. 1970, 9p
Pub. in Chemical Engineering Symposium Series, Water, v67 n107 p310-320 1970.

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Chemical removal (Sewage treatment), *Phosphorus), (*Precipitation (Chemistry), Phosphorus), Calcium oxides, Inorganic phosphates.

Liming of District of Columbia raw or treated wastewater to pH 10 insolubilized the various forms of phosphorus in the wastewater, but removals to residuals of 0.3 mg./liter as P occurred only above pH 11.5, where precipitated magnesium hydroxide flocculated the turbidity. Nitrification of the wastewater during biochemical (secondary) treatment reduced the lime requirement for precipitation, the amounts of sludge from precipitation, and also improved phosphorus removals. Liming of organic free solutions insolubilized mixtures of ortho and polyphosphates by pH 10, although insolubilization of meta or tripolyphosphate alone required a pH above 11. The degree of biochemical oxidation significantly influenced the phosphorus removals, while temperature and ionic strength did not. (Author)

PB-217 627
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
TECHNICAL APPROACHES TOWARD EVALUATING ESTUARINE POLLUTION PROBLEMS,
A. F. Bartsch, R. J. Callaway, R. A. Wagner, and C. E. Woelke. 1967, 9p
Pub. in Estuaries, Pub 83 American Association for the Advancement of Science, p693-700 1967.

Descriptors: (*Paper industry, Water pollution), (*Estuaries, Water pollution), (*Pacific Northwest, *Water pollution), Biological surveys, Oceanography, Puget Sound.

Pollution caused by the discharge of pulp and paper mill wastes into marine waters of the Pacific Northwest at Everett, Bellingham, Anacortes, and Port Angeles, Washington, has stimulated field investigations to determine the effects of such wastes on water quality, water uses, and the marine environment. The program consists of in-plant surveys, oceanographic studies, biological studies, and economic studies.

PB-217 628
Cleveland, Ohio.
THE USE OF ORGANIC POLYELECTROLYTE FOR OPERATIONAL IMPROVEMENT OF WASTE TREATMENT PROCESSES,
John J. Wirts. May 69, 105p
Grant FWPCA-WPRD-102-01-68

Descriptors: (*Sewage treatment, Flocculating), (*Polyelectrolytes, *Flocculants), Cost estimates.

Federal Water Pollution Control Administration - City of Cleveland demonstration of Raw Waste Flocculation Process conducted at Cleveland Easterly showed significant improvements in plant operations, such as (1) increase in SS and BOD removals in primary treatment, (2) more efficient operation of the secondary treatment process, (3) increase in sludge pumpability in a 13 mile force main, and (4) cost savings approaching cost of polymer treatment. A detailed cost analysis showed that significant capital costs savings could result if this process were practiced. A completely automated polymer dispersal and addition system was developed.

PB-217 629
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
A REPORT OF WATER POLLUTION IN THE SOUTH PLATTE RIVER BASIN.
Water pollution series.
Feb 53, 59p PHS-Pub-235, PHS-WPS-39

Descriptors: (*Platte River Basin, *Water pollution), (*Colorado, Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution).

The report is based on data gathered and reported in the South Platte River Basin Water Pollution Investigation of 1950. The report also presents information concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect and those needed.

PB-217 630
Public Health Service, Kansas City, Missouri Drainage Basin Office.
A REPORT OF WATER POLLUTION IN THE KANSAS RIVER BASIN.
Water pollution series.
Feb 53, 75p PHS-Pub-234, PHS-WPS-38

Descriptors: (*Kansas River Basin, *Water pollution), (*Colorado, Water pollution), (*Kansas, Water pollution), (*Nebraska, Water pollution).

The report is based on data gathered and reported in the Kansas River Basin Water Pollution Investigation of 1949 and subsequent information. The report presents data concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect, and those needed.

PB-217 631
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.

WATER SAMPLING FROM FIXED WING AIRCRAFT,
Charles W. Ferst, and R. Kenneth Tinsley. Aug 69, 14p

Descriptors: (*Water pollution, Sampling), Aircraft.

When a pesticide formulation plant and warehouse at Massies Mill, Virginia, was destroyed by flood waters in 1969, it was not known whether the pesticides or other toxic materials had contaminated the river, and samples were urgently needed during the initial flood period. Boat sampling or sampling from a helicopter were unsafe, and representative sampling locations were inaccessible. It was decided that samples would be taken utilizing an aerial pick-up technique generally used for air rescue operations. The report describes this technique.

PB-217 632
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SEPTIC TANKS: STUDIES AND PERFORMANCE,
S. R. Weibel. 1954, 15p
For presentation at the meeting of the North Atlantic Section, American Society of Agricultural Engineers, August 24-26, 1954, at the University of Vermont, Burlington, Vermont.

Descriptors: (*Septic tanks, Performance evaluation).

The studies discussed were aimed primarily for unsewered urban fringe areas. Progress in transportation and electrification which has enabled modern living in fringe areas has also brought modern living to the farm. The common system is a septic tank followed by subsurface application to the soil by either shallow trenches or deeper pits.

PB-217 633
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
STATISTICAL CONSIDERATIONS RELATED TO THE PLANNING AND OPERATION OF A NATIONAL AIR SAMPLING NETWORK,
Eugene K. Harris, and Elbert C. Tabor. May 56, 19p
Pub. in Proceedings of the Annual Meeting APCA (49th), Buffalo, N.Y., 20-24 May 56, p35-1 - 35-18.

Descriptors: (*Air pollution, *Gas sampling), Statistical analysis.
Identifiers: *National Air Surveilance Networks, *Air pollution sampling.

The national air sampling program involves at present about 90 high-volume sampling stations and over 30 metropolitan areas. In planning future operations of the program, attention has been directed to statistical considerations involved in its most effective use. The present paper will discuss some of these.

PB-217 634
Bendix Research Labs., South field, Mich.
STEAM CAR CONTROL ANALYSIS.
Quarterly rept. no. 4,
E. A. Mayer, and G. W. Hurlong. 10 Mar 72, 92p RLD-6179
Contract BOA-68-04-0004

Descriptors: (*Steam engines, Performance evaluation), (*Automobile engines, Steam engines), Computerized simulation, Mathematical models, Design criteria.

The paper reports on quarterly progress made on the design of a steam engine. Included are digital computer simulations of the steam generator and burner and combustor systems.

PB-217 635
California Univ., Davis.

EFFECT OF WALL DEPOSIT ON PHOTOCHLORINATION KINETICS,
Dariusz Ziolkowski, A. E. Cassano, and J. M. Smith. 1967, 4p
Grant FWPCA-WP-00952
Pub. in AIChE Jnl., v13 n5 p1025-1028 Sep 67.

Descriptors: (*Chlorination, *Hydrocarbons), (*Photochemistry, Chlorination), Deposits.

Several references in the literature have given evidence of reactor wall deposits in photochlorination of hydrocarbons in the gas phase. The expected effect of the deposit is to reduce the light intensity, which in turn lowers the reaction rate. The work reported was designed to determine the effect of the wall deposit on the significance of heterogeneous termination steps.

PB-217 636
Ohio State Univ., Columbus. Dept. of Microbiology.
CONCENTRATION AND ACCUMULATION OF METALLIC IONS BY THE BACTERIUM 'ZOOGLOEA',
Barry A. Friedman, and Patrick R. Dugan. 1968, 8p
Grant FWPCA-WP-00713-04
Pub. in Developments in Industrial Microbiology, 1968, p381-388.

Descriptors: (*Pseudomonadaceae, Metals), Metabolism, Biochemical oxygen demand, Activated sludge process, Bacteria, Biochemistry, Physiology, Enzymes, Zinc, Accumulation.

Zoogloea-producing bacteria are common in natural waters and appear to be able to survive and grow in the presence of rather high concentrations of contaminants. They have been isolated consistently from oxidative waste treatment systems where they have been reported to cause a rapid decrease in the biochemical oxygen demand. Our interest in these organisms is centered upon the unique properties of the zoogleal material surrounding the cells. It is lacking in nonzoogloea-forming organisms. Studies have been made of several of these bacteria and their ability to concentrate several metallic ions. (Author)

PB-217 637
Federal Water Pollution Control Administration, Cincinnati, Ohio.
PREPOST TEST QUESTIONS ON PRINCIPLES OF WASTEWATER TREATMENT.
26 Mar 68, 11p

Descriptors: (*Sewage treatment, *Tests), Education.

An unidentified document lists a series of test questions on waste water content, properties, and treatment methods.

PB-217 638
Public Health Service, Portland, Oreg. Region IX.
SYMPOSIUM ON RESEARCH RELATED TO WATER POLLUTION IN THE NORTHWEST (3RD),
E. F. Eldridge. 4 Apr 58, 5p

Descriptors: (*Slime, *Columbia River Basin), (*Aquatic microbiology, Slime), (*Sphaerotilus, Columbia River Basin).

The meetings were held to discuss the slime growth (Sphaerotilus) problem. The report gives the topics of the studies presented.

PB-217 639
Tennessee Univ., Knoxville. Engineering Experiment Station.
INDEX TO 'BIBLIOGRAPHY AND ABSTRACTS OF ARTICLES RELATING TO SLAUGHTERHOUSE AND PACKINGHOUSE WASTES',
Donald D. Gold. May 51, 7p
See also PB-104 318.

Descriptors: (*Food processing, *Bibliographies), Indexes (Documentation).
Identifiers: *Slaughtering house wastes.

When originally prepared, no index was included with the annotated bibliography. Since its value would be decreased without an index, one has been prepared. The entries of the index are for the report, 'Bibliography and Abstracts of Articles Relating to Slaughterhouse and Packinghouse Wastes,' Bulletin No. 14, May 1951, Engineering Experiment Station, The University of Tennessee, Knoxville, Tennessee.

PB-217 640
Southwestern Radiological Health Lab., Las Vegas, Nev.
TRITIUM CONCENTRATIONS IN FOOD, 1967--1968,
A. A. Moghissi, and R. J. Lyon. May 70, 4p

Descriptors: (*Tritium, *Food), (*Radioactive isotopes, Food), (*Radioactive contaminants, Food), Public health, Children, Radiation dosage.

Tritium concentrations were determined in food samples obtained from several children's homes in the United States. The average concentrations of tritium in food indicate a decreasing trend from 1967 to 1968. The average dose equivalent from tritium in food was calculated to be 0.08 mrem for 1967 and 0.03 mrem for 1968. (Author)

PB-217 641
Southwestern Radiological Health Lab., Las Vegas, Nev.
TRITIUM BODY BURDEN OF CHILDREN, 1967-1968,
A. A. Moghissi, and Robert Lieberman. May 70, 5p

Descriptors: (*Tritium, *Children), (*Radiation hazards, Tritium), Body fluids, Radioactive isotopes, Radiation dosage, Urine, Surface waters, Sources, Public health.

The tritium concentration in body water of children was determined from samples of urine taken from two children in each of nine Institutional Total Diet Sampling stations. The tritium concentrations in body water of children gradually decreased from about 1.5 nCi/liter to less than 0.2 nCi/liter during the period, January 1967 to December 1968. Several anomalies were noted. The dose equivalent from tritium for standard man was calculated to be 0.15 mrem for 1967 and 0.13 mrem for 1968. The dose equivalent for children varies according to age and is roughly 0.1 mrem for a 13-year-old child. (Author)

PB-217 642
Environmental Health Service, Rockville, Md.
TRITIUM CONCENTRATION IN PRECIPITATION, 1967-1968,
A. A. Moghissi, and C. R. Porter. 1969, 4p
Pub. in Radiological Health Data and Reports, v11 n3 p137-140 Mar 70.

Descriptors: (*Radioactive contaminants, Tritium), (*Fallout, Tritium), Environmental surveys, Precipitation (Meteorology).

Beginning in 1967, the Bureau of Radiological Health established a tritium in rain network as part of the existing Radiation Alert Network. Ten stations were selected covering the United States, including Alaska and the Hawaiian Islands. The locations of these stations are shown and the sampling procedure is described.

PB-217 643
Federal Water Pollution Control Administration, Cincinnati, Ohio. Advanced Waste Treatment Branch.
COLLOIDS COMPLICATE TREATMENT PROCESSES,
Robert B. Dean. 1969, 5p
Pub. in Environmental Science and Technology, v3 n9 p820-824 Sep 69.

Descriptors: (*Sewage treatment, *Colloids), Reviews.

The article discusses high molecular weight polymers, which are natural anionic polyelectrolytes bearing an excess of negative charges. They are present in the effluents of waste water treatment plants employing biological processes. These colloids are derived principally from the capsular slimes of bacteria and other microorganisms. Although the absolute quantity of polymers is less than 10 mg. l., the effects produced by these hydrocolloids have a large influence on physiocochemical processes used to purify waste water. The polymers offer great resistance to filtration and interfere with other membrane processes such as electrodialysis and heat transfer.

PB-217 644
Southwestern Radiological Health Lab., Las Vegas, Nev.
EFFECTS OF MICROWAVES ON OPTICAL ACTIVITY,
A. A. Moghissi, G. L. Rehnberg, and E. W. Pepper. 1969, 4p
Prepared in cooperation with Southeastern Radiological Health Lab., Montgomery, Ala. Pub. in Proceedings of Symposium on Biological Effects and Health Implications of Microwave Radiation, held in Richmond, Va., 17-19 Sep 69. Sponsored in part by Bureau of Radiological Health, Washington, D.C.

Descriptors: (*Microwaves, *Dosimeters), (*Eye injuries, Microwaves).

The effects of microwave irradiation on optical activity are under investigation with the overall objective of developing a chemical dosimeter based on changing the optical activity of a compound with microwave irradiation. The initial phase of the study was to determine if microwave irradiation would in fact produce a change in the optical activity of a compound. Preliminary data indicate the presence of specific optical rotation changes as a result of microwave exposure, the optical activity being reduced in proportion to the amount of microwave exposure.

PB-217 645
Eastern Environmental Radiation Lab., Montgomery, Ala.
RADIOLOGICAL SURVEYS OF PEARL HARBOR, HAWAII, AND ENVIRONS, 1966-1968,
Daniel F. Cahill, H. D. Harvey, Jr., D. C. McCurry, W. D. Breakfield, and A. A. Moghissi. 1972, 12p
Pub. in Radiation and Data Reports, p323-334 Jun 72.

Descriptors: (*Hawaii, Radioactive contaminants), Pearl Harbor, Radioactive isotopes, Radiobiology, Cobalt 60.

The report describes the conduct of the onsite surveys performed at Pearl Harbor in 1966 and 1968 and presents the results of the laboratory analyses of numerous environmental samples.

PB-217 646
Federal Water Quality Administration, Washington, D.C.
FEDERAL GUIDELINES: DESIGN, OPERATION AND MAINTENANCE OF WASTE WATER TREATMENT FACILITIES.
Sep 70, 48p

Descriptors: (*Sewage treatment, Design criteria), Recommendations.
Identifiers: *Sewage treatment plants.

Contents:
Guidelines for design: Preliminary project planning and engineering report;

(environmental compatibility, regionalization, project feasibility, complete and operable treatment works, ultimate disposal of sludge and solids, treatment plant reliability, excessive infiltration, elimination of by-passing, industrial wastes, staffing and budget for a facility, design period, combined sewerage systems);
Preparation of plans and specifications;
(design summary, reliability, discharges to shellfish, potable or recreational waters, elimination of by-passes and overflows, treatment during construction, experimental processes or equipment, flexibility and ease of operation and maintenance, protection of effluent quality, safety features, interceptor sewers, general requirements);
Guidelines for operation and maintenance;
(federal and state inspections, personnel, records, reports, and laboratory control, process control).

PB-217 647
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY STUDY: MIDDLE SNAKE RIVER,
Danforth G. Bodien. Feb 70, 80p Working Paper-69

Descriptors: (*Snake River, *Water pollution), (*Idaho, Water pollution), (*Oregon, Water pollution).
Identifiers: *Water quality data, High Mountain Sheep Dam.

The report includes the data from the above mentioned surveys as well as data from the Federal Water Pollution Control Administration (FWPCA) Pollution Surveillance Branch, Northwest Regional Office, the U. S. Geological Survey, and the Bureau of Commerical Fisheries.

PB-217 648
National Inst. of Dental Research, Bethesda, Md.
FLUORIDE DRINKING WATERS.

1962, 640p PHS-Pub-825-Ed-62

Descriptors: (*Dental caries, Fluorides), (*Fluorides, *Water supply), (*Water pollution, Fluorides), Public health, Oral diseases, Dentistry, Metabolism, Physiology, Potable water.
Identifiers: *Preventive dentistry, Enamel (Dental).

Contents:
Endemic dental fluorosis (Mottled enamel);
Relation of dental caries to fluoride drinking waters;
Fluoridation of drinking water and control of dental caries;
Topically applied fluoride and dental caries control;
The physiological effects of fluoride;
Experimental laboratory research relative to effects of fluoride;
Quantitive analysis and chemical reactions of fluoride.

PB-217 649
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
MISSOURI-SOURIS DEVELOPMENT AREA WATER POLLUTION INVESTIGATION.
Water pollution series.

Jan 52, 279p PHS-Pub-177, PHS-WPS-32
Prepared in cooperation with Minnesota State Dept. of Health, North Dakota State Dept. of Health, Montana State Board of Health, and South Dakota State Dept. of Health.

Descriptors: (*Missouri River Basin, *Water pollution), (*Souris River Basin, *Water pollution), (*Red River Basin, *Water pollution), (*North Dakota, Water pollution), (*Minnesota, Water pollution), (*Montana, Water pollution), South Dakota, Wyoming, Stream flow, Sources.

The Missouri-Souris portion of the land and water resources development program for the Missouri River Basin includes that reach of the Missouri River from below the mouth of Milk River in Montana to the mouth of Spring Creek, South Dakota, the Devils Lake Area, the James River Basin, and the United States portions of the Souris and Red River Basins. The plan calls for diversion of Missouri River water at strategic points for multipurpose use and to supplement available water in the Souris, Red, and James River Basins. This report covers the Missouri-Souris-Red area. The James River Basin will be presented in another report. Among the many contemplated water uses of the resource conservation plan are those for municipal, industrial, public health, sanitation and related purposes. In order to determine these needs, information is required on present water quantity and quality; and types, sources, and extent of pollution in streams of the region. A general section of the report deals with over-all water supply and water pollution problems pertinent to the area and includes survey methods, review of State Water Pollution Control Law, conclusions and recommendations. The major sub-basins are discussed in detail in separate sections of the report. Pertinent detail information, laboratory and flow data, and other presentations are included as appendixes.

PB-217 650
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION: NEW HAMPSHIRE.
Sep 68, 11p

Descriptors: (*Water pollution, *Legislation), (*New Hampshire, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations for the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 651
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION: NEVADA.
Sep 58, 7p

Descriptors: (*Water pollution, *Legislation), (*Nevada, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as watershed development, fishing, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 652
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION: NEBRASKA.
Sep 58, 8p

Descriptors: (*Water pollution, *Legislation), (*Nebraska, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fishing, dead animal disposal, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisanced by legal proceedings.

PB-217 653
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION, *LEGISLATION), (*MONTANA, WATER POLLUTION).
Sep 58, 10p

Descriptors: (*Water pollution, *Legislation), (*Montana, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as mining, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 654
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION. MISSOURI.
Sep 58, 8p

Descriptors: (*Water pollution, *Legislation), (*Missouri, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fishing, riparian rights, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 655
Public Health Service, Washington, D.C.
DIGEST OF MISSISSIPPI WATER POLLUTION CONTROL LEGISLATION.
Sep 58, 6p

Descriptors: (*Water pollution, *Legislation), (*Mississippi, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plan and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fishing, industrial wastes, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 656
Public Health Service, Washington, D.C.

DIGEST OF MINNESOTA WATER POLLUTION CONTROL LEGISLATION.
Sep 58, 9p

Descriptors: (*Water pollution, *Legislation), (*Minnesota, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations.

PB-217 657
Public Health Service, Washington, D. C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION. LOUISIANA.
1958, 11p

Descriptors: (*Water pollution, *Legislation), (*Louisiana, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as industrial wastes, road construction, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 658
Public Health Service, Washington, D.C.
DIGEST OF MAINE WATER POLLUTION CONTROL LEGISLATION.
Sep 58, 10p

Descriptors: (*Water pollution, *Legislation), (*Maine, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in various areas. Authority is given to abate public nuisances by legal proceedings.

PB-217 659
Public Health Service, Washington, D.C.
DIGEST OF MARYLAND WATER POLLUTION CONTROL LEGISLATION.
Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*Maryland, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as wells, ship wastes, fishing, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 660
Public Health Service, Washington, D.C.
DIGEST OF MASSACHUSSETTS WATER POLLUTION CONTROL LEGISLATION.
Sep 58, 8p

Descriptors: (*Water pollution, *Legislation), (*Massachusetts, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as petroleum and bilge disposal, fish life, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 661
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SPOT TEST DETECTION AND SPECTROPHOTOMETRIC CHARACTERIZATION AND DETERMINATION OF CARBAZOLES WITH 3-METHYL-2-BENZOTHIAZOLONE HYDRAZONE, P-NITROSOPHENOL, AND FLUOROMETRIC METHODS. APPLICATION TO AIR POLLUTION,
Eugene Sawicki, Thomas R. Hauser, Thomas W. Stanley, Walter Elbert, and Frank T. Fox. 1960, 17p

Descriptors: (*Carbazoles, *Gas analysis), (*Spot tests, Carbazoles), (*Spectroscopic analysis, Carbazoles), Hydrazones, Nitroso compounds.
Identifiers: *Air pollution detection.

Carbazole has been detected in some airborne particulate samples. Two spectrophotometric methods for the determination of carbazole are introduced. Beer's law was obeyed from 4 to greater than 90 microgram of carbazole in the 3-methyl-2-benzothiazolone hydrazone and p-nitrosophenol procedures. Both methods can be used for the estimation of carbazole in the benzene extracts of airborne particulates. Two new spot tests for carbazole are also introduced. With the p-nitrosophenol test 0.4 microgram of carbazole can be detected. This test can be applied to air samples. In strongly alkaline solution 0.2 microgram of carbazole can be detected through the brilliant blue fluorescence of the anion.

PB-217 662
Environmental Prottection Agency, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
THE COST OF DISPERSED FLOC NITRIFICATION AND DENTRIFICATION FOR REMOVAL OF NITROGEN FROM WASTEWATER,
Robert Smith. Nov 70, 11p

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Nitrification, *Chemical removal (Sewage treatment)), Cost estimates.
Identifiers: *Dentrification.

Cost estimates have been made for nitrogen removal by means of nitrification and denitrification using two dispersed growth reactors in series. Preliminary cost data developed by Black and Veatch, under the terms of the FWQA contract, were used as a basis for the cost estimate. Cost estimates for nitrification alone were made using the same assumptions and the tables are attached.

PB-217 663
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NATIONAL WATER QUALITY NETWORK OPERATING MANUAL. A GUIDE FOR LABORATORIES PARTICIPATING IN SAMPLING AND ANALYTICAL ACTIVITIES OF THE NATIONAL WATER QUALITY NETWORK.

Oct 60, 65p

Descriptors: (*Water pollution, Sampling), (*Water analysis, Water pollution), Manuals.
Identifiers: *Water pollution sampling.

Contents: The national water quality network (laboratory analyses, sampling); General instructions (sampling schedules, shipping instructions, assistance with sampling, laboratory, and other operational problems); Carbon filter sampling (installation of sampling equipment, presettling, prefilter, and backwash, filter arrangement, pumping, collection of sample, precautions, shipping); Collection of samples for radioactivity measurements; Collection of sample for plankton analysis; Membrane filter delayed incubation procedure (supplies, sampling, shipping); Chemical and physical analyses (standard reagents, total alkalinity, chloride, chlorine demand, color, hardness, ammonia nitrogen, hydrogen ion concentration (pH), total dissolved solids, sulfate, temperature, turbidity, dissolved oxygen (D.O.), biochemical oxygen demand (B.O.D), chemical oxygen demand (C.O.D), determination of phosphate (orthy plus poly)); Handling of analytical data (Reporting of results, presentation of results).

PB-217 664
Environmental Health Center, Cincinnati, Ohio.
STUDIES ON THE WASTES OF A NAVAL STORES PLANT.
Industrial waste survey rept. 5 Dec-15 Dec 50,
Virgial A. Minch, and Albert L. Platz. 1950, 45p

Descriptors: (*Wood products, *Industrial wastes), (*Water pollution, Wood products).
Identifiers: *Wood processing industry.

The study was undertaken as part of the Public Health Service program of industrial waste studies. A study was made of the stump washer effluent, and the main outfall and the various components that make up the plant effluent. Gulf Naval Stores Company operates 12 extractors to produce FF wood rosin, turpentine, pine oil and dipentent. The survey was conducted to determine the quantities and characteristics of process wastes resulting from the operation of a naval stores plant. Results of this work and similar studies will serve as basis for preparation of an industrial waste guide on naval stores wastes.

PB-217 665
Southeastern Radiological Health Lab., Montgomery, Ala.
LOW-LEVEL LIQUID SCINTILLATION COUNTING OF ALPHA- AND BETA-EMITTING NUCLIDES,
A. A. Moghissi. 1970, 10p
Pub. in The Current Status of Liquid Scintillation Counting, p 86-94 1970.

Descriptors: (*Scintillation counters, Reviews), Alpha particle detectors, Beta particles.

The paper reviews the efforts of the Southeastern Radiological Health Laboratory in low-level counting by liquid scintillation. The author has dealt primarily with (3H) counting but have recognized that low-level counting of other radionuclides may be carried out advantageously by the same technique. All investigations reported here have been carried out using a Beckman liquid scintillation system except where specifically mentioned. There are a number of factors affecting the performance of low-level counting systems, and various attempts have been made to correlate these factors in a single formula. The major factors determining the sensitivity of a low-level counting system are background, efficiency, and sample size. Other factors, such as the requirements of time and skill for sample preparation, and the convenience of operation, are important but have relatively little effect on the sensitivity of the system.

PB-217 666
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes-Illinois River Basins Project.
RUNOFF AS A SOURCE OF PHOSPHATE IN THE WATERS OF STREAMS AND LAKES,
Harold A. Hall. 28 Apr 68, 11p

Descriptors: (*Water pollution, *Inorganic phosphates), (*Surface water runoff, Water pollution), Nutrients, Sources.
Identifiers: Path of pollutants.

The major sources of phosphate substances in surface waters are human wastes, synthetic detergents, certain industrial wastes, and runoff from agricultural and forest lands. The purpose of this paper is to discuss some of the factors which bring about various concentrations of phosphate substances in the runoff from rural areas (agricultural and forest land), present the results obtained in stream surveys, and estimate the contribution of phosphate from land runoff.

PB-217 667
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
OPERATIONS RESEARCH IN WATER QUALITY MANAGEMENT.
Final rept.,
Harold A. Thomas, Jr., and Robert P. Burden. 15 Feb 63, 179p
Contract PH-86-62-140

Descriptors: (*River basin development, *Mathematical models), (*Water resources, *Operations research), Stream flow, Sewage treatment, Economic development.

New methods are reported for evaluating the composite effects of combinations of streamflow regulation, waste water treatment, and waste water regulation for application in comprehensive programs to improve and maintain the quality for water in major water resources systems. The objective is to show how these methods may be used to strengthen the rational base for river basin planning by use of mathematical systems analysis.

PB-217 668
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
DEVELOPMENT OF DISSOLVED OXYGEN PROBE CLEANING APPARATUS,
Clifford L. Cole. Jun 67, 10p

Descriptors: (*Monitors, *Dissolved gases), (*Water pollution, Monitors), Design, Cleaning, Automation.

The Federal Water Pollution Control Administration operates a network of water pollution surveillance stations throughout the United States, consisting largely of automatic monitors emplaced on rivers and streams to record water quality changes throughout the year. The automatic monitors serve as a crucial information source in water quality management to protect desired water uses, particularly fish migration. During the critical period, the data must be keyed to weather and streamflow forecasts to allow management agencies to maintain water quality above minimum levels. The report describes the device which was developed to reduce the maintenance time and expense required for accurate water quality information from automatic monitors.

PB-217 669
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE DISTRIBUTION OF RADIOACTIVITY FROM RAIN,
Lloyd R. Setter, and Conrad P. Straub. 1951, 27p
Presented at the American Geophysical Union Meeting, Washington, D.C., 29 Apr - 1 May 57.

Descriptors: (*Air pollution, Radioactive contaminants), (*Water pollution, Radioactive contaminants), (*Ohio River, *Radioactive contaminants), Correlations, Rainfall, Particles.
Identifiers: *Precipitation washout.

Fallout measurements, largely as precipitation, have been made on a continuous basis at Cincinnati, Ohio, since March 1953. The studies were implemented in October 1953 by weekly or daily tests of the atmospheric particulate activity and by the operation of an experimental cistern near the site of the rain collector. Correlation is made between air particle concentration and rainout (washout by precipitation) and distribution of activity between the separated solids and the supernatant liquid in the cistern liquid can be determined. The report includes data relating to activity levels in air particulates, rainfall, and certain Ohio rivers. (Author Modified Abstract)

PB-217 670
Federal Water Pollution Control Administration, College, Alaska. Alaska Water Lab.
WASTE TREATMENT SECTION.
Quarterly research rept. 1 Oct-31 Dec 69.

31 Dec 69, 22p

Descriptors: (*Lagoons (Ponds), *Cold weather tests), (*Alaska, Lagoons (Ponds)), (*Sewage treatment, Lagoons (Ponds)).
Identifiers: *Aeration ponds.

The paper reports on progress made in a project to establish design criteria for the aerated lagoon waste treatment process in Alaska. Design criteria will include operational efficiency versus loading, evaluation of construction methods, evaluation of types of feasible equipment, and process modifications to provide more efficient plant utilization. The project will also evaluate parameters and contribution to effluent quality, power and maintenance costs, and reliability.

PB-217 671
Environmental Health Center, Cincinnati, Ohio.
STUDIES ON HOUSEHOLD SEWAGE DISPOSAL SYSTEMS. PART I.,
S. R. Weibel, C. P. Straub, and J. R. Thoman. 1949, 279p

Descriptors: (*Septic tanks, *Reviews), Design.

Contents: Review of literature; Experimental and survey studies; Design practice (House sewers, septic tanks, subsurface disposal systems, seepage pits, cesspools); Design practice outside the United States (Canada, England, India, Australia, New Zealand, South Africa, Rhodesia, Germany, Poland, Venzuela, Ecuador, Dominican Republic); Study of experimentally operated septic tanks; Study of septic tanks in field, sludge and scum accumulations; Laboratory investigation of sludge, yeast, as starters; Experimental investigation effect of zeolite softener salts on digestion; and Survey of information on the freezing aspects of household sewage.

PB-217 672
Bureau of Community Environmental Management, Rockville, Md.
DEMONSTRATION GUIDE FOR PREVENTION OF ELECTRIC SHOCK INJURY.
1969, 53p PHS-Pub-1952

Descriptors: (*Accidents, Electrical shock), (*Electrical shock, Prevention), Injuries, Hazards, Safety, Manuals.
Identifiers: Emergency medical care.

The guide contains suggestions for the development and safe use of an effective demonstration tool intended to be used as part of a total program for prevention of electric shock injury. In itself, the demonstration unit is not a program. The treatment of the subject is not intended to be definitive or all inclusive. It is flexible and permits the addition of new developments to meet the local needs and interests of the community.

PB-217 673
Dynatech Corp., Cambridge, Mass.
AN ELECTROCHEMICAL METHOD FOR REMOVAL OF PHOSPHATES FROM WASTE WATERS,
Shafik E. Sadek. Feb 70, 53p
Contract DI-14-12-405
Paper copy available from GPO $0.50 as I67.13/4:17010-02/70.

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Phosphorus, *Chemical removal (Sewage treatment)), Inorganic phosphates, Electrochemistry, Operating costs.

The report determines the effectiveness of an expendable electrode, direct current method for the removal of phosphates from the effluent of a secondary treatment process. The evaluation consists of measuring electrode and power consumption and phosphate removal as a function of voltage, electrode material (aluminum or iron), electrode spacing, and residence time. Batch tests were followed by continuous flow (steady-state) tests. A number of tests were run on raw sewage to evaluate the use of the system as a combined phosphate removal/bubble flotation operation.

PB-217 674
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
SOUTH PLATTE RIVER BASIN WATER POLLUTION INVESTIGATION.
Water pollution series.
Jul 50, 296p
See also PB-217 830.

Descriptors: (*Platte River Basin, *Water pollution), (*Colorado, Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution), Sources, Law (Jurisprudence), Irrigation, Water supply.

The objectives of this survey were to determination of the extent, types, and major sources of pollution in the basin, review existing state laws in Colorado, Wyoming, and Nebraska and pending legislation regarding pollution of public waters, determination of the sanitary quality of water for irrigation uses at present and at proposed diversion points and in existing canals, minimum stream flows necessary below the reservoirs for public water supplies and for sanitation purposes with present and contemplated pollution loads, public water supply needs, possible benefits to the abatement of water pollution problems by reservoir releases, and recommendations and existing plans for pollution abatement.

PB-217 675
Missouri Univ., Columbia.
INSECTS ASSOCIATED WITH MIDWESTERN OXIDATION LAGOONS.
Terminal progress rept. 1 Sep 64-31 Aug 67,
Wilbur R. Enns. 31 Aug 67, 21p
Grant PHS-WP-00718

Descriptors: (*Lagoons (Ponds), *Entomology), (*Sewage treatment, Lagoons (Ponds)), (*Insect control, Lagoons (Ponds)).

The aims of this project were to study intensively the entomological fauna of sewage lagoons including insects, crustacea, mites, spiders, and sowbugs in all sorts of lagoons from the newest, rawest ones to old ones, including primary and secondary lagoons; to investigate predator and prey species in lagoons and determine which predators are most effective in suppressing midges and mosquitoes; to determine whether insect pathogens are present

and whether they can be manipulated artificially; and to investigate the possibility of manipulating insect populations in ways which maintain a lagoon in good balance.

PB-217 676
Iowa Engineering Experiment Station, Ames.
DESIGN REQUIREMENTS FOR MUNICIPAL DIATOMITE FILTERS.
Progress rept. no. 3, 1 Mar 64-30 Nov 65,
Paul E. Morgan, and E. Robert Baumann. 15 Dec 65, 263p
Grant PHS-WP-00196
See also Progress rept. no. 2, dated 15 Dec 65, PB-217 270.

Descriptors: (*Diatomaceous earth, *Filter aids), (*Sewage filtration, Filter aids), (*Filtration, Filter aids), Nemerical analysis, Sand filtration.

The study was undertaken to determine the characteristics of municipal applications in which diatomite filters may be used successfully, to study the effect of various variables on filtration economy and effectiveness, and to outline a procedure for designing a plant to operate with maximum economy. Diatomite filtration equations were developed to predict the head loss-time relationship during a filter run by use of empirical filter cake resistance measurements. An equation was developed to predict filter cake resistance from measureable filtration variables. Empirical constants in the prediction equation were collected in pilot filter runs. A digital computer program was prepared to use the equations and cost information to optimize plant design.

PB-217 677
Iowa State Univ., Ames. Engineering Research Inst.
PROPOSED STANDARD PROCEDURES FOR DETERMINATION OF THE EFFECTIVE SPECIFIC GRAVITY, BULK DENSITY, AND FILTER CAKE RESISTANCE OF PRECOAT FILTER AIDS.
Final rept., (Part IV),
E. R. Bauman, and C. S. Oulman. 15 Jun 68, 48p
ERI-263
Contract DAAKO2-67-C-0408, Grant FWPCA-00196

Descriptors: (*Filter aids, Properties), (*Filtration, Filter aids), Density (Mass/volume), Tests.

The report describes a test procedure that has been established to determine the effective specific gravity of filter aids for use in calculating the voids in a filter cake, and a test procedure developed for use in the determination of the bulk density and a filter aid resistance index of filter aids.

PB-217 678
Iowa State Univ., Ames. Engineering Research Inst.
RATIONALE FOR A MATERIAL SPECIFICATION FOR COMMERCIAL FILTER AIDS FOR MILITARY USE.
Final rept., (Part III),
Charles S. Oulman, and E. Robert Baumann. Aug 68, 51p ERI-268
Contract DAAKO2-67-C-0408, Grant FWPCA-WP-00196

Descriptors: (*Filter aids, Performance evaluation), (*Filtration, Filter aids), Diatomaceous earth, Perlite.

The report determines the principal characteristics of filter aids that must be specified when comparing their relative effectiveness for removing suspended solids from water.

PB-217 679
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION. NEW YORK.
Feb 59, 12p

Descriptors: (*Water pollution, *Legislation), (*New York, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fish and shellfish conservation, dead animal disposal, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 680
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION. RHODE ISLAND.
Sep 58, 10p

Descriptors: (*Water pollution, *Legislation), (*Rhode Island, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as willful contamination, tidewaters, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 681
Robert A. Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
ADVANCED WASTE TREATMENT SYSTEMS AT THE ENVIRONMENTAL PROTECTION AGENCY. DISTRICT OF COLUMBIA PILOT PLANT,
Dolloff F. Bishop, Thomas P. O'Farrell, John Stamberg, and J. Winston Porter. Mar 71, 41p
Presented at National Meeting of the AIChE (68th) Houston, Tex. Mar 71.

Descriptors: (*Sewage treatment, Performance evaluation), Design, Cost estimates.
Identifiers: *Tertiary sewage treatment, *Physical chemical treatment.

The report describes facilities and processes at the EPA-DC pilot plant for advanced waste treatment research. Included are a multipurpose plant, an activated sludge plant, a physical-chemical treatment plant, an ozone plant, and solids handling plant.

PB-217 682
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
WASTEWATER INVENTORY, POTOMAC RIVER BASIN,
Norbert A. Jaworski, and Johan A. Aalton. Dec 68, 58p

Descriptors: (*Potomac River Basin, *Water pollution), Inventories, Tables (Data), Maryland, Pennsylvania, Virginia.
Identifiers: *Water quality data.

As part of the Chesapeake Bay-Susquehanna River Basins Project, the Chesapeake Field Station (CFS), Middle Atlantic Region , Federal Water Pollution Control Administration (FWPCA) has undertaken a comprehensive water quality management study of the Potomac River Basin. Important phases of this study are the determination of the effects of wastewater discharges on water quality in the Potomac Estuary and the recommendation of a program to achieve the approved water quality standards for this interstate river. An essential part of the background investigation has been the compilation of a current inventory of all wastewater discharges in the Potomac River Basin.

PB-217 683
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
VESSEL POLLUTION STUDY, SAN DIEGO BAY, CALIFORNIA.

Jun 69, 65p

Descriptors: (*San Diego Bay, *Water pollution), (*Ships, Water pollution), (*California, Water pollution), Naval ships.

A two-year study in San Diego Bay reveals that vessel waste discharges produce undesirable water quality conditions in areas of concentrated vessel activity. The study examined the effects of waste discharges representative of up to one-fourth of the U.S. Navy's entire active fleet, more than twenty-five hundred pleasure craft containing sanitary facilities, over a hundred ships of the West Coast commercial fishing fleet, and commercial freight vessels carrying in excess of a million tons of cargo to the Port of San Diego each year. Wastes discharged from these vessels were found to create conditions that are hazardous to health, aesthetically offensive and damaging to ecological balances in San Diego Bay. (Author)

PB-217 684
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
CENTRAL MISSOURI RIVER WATER QUALITY INVESTIGATION, 1954.
Aug 55, 103p

Descriptors: (*Missouri River, *Water pollution), (*Iowa, Water pollution), (*Nebraska, Water pollution), (*South Dakota, Water pollution), (*North Dakota, Water pollution), Biological surveys.
Identifiers: *Water quality data.

Biological samples were collected at weekly intervals at Council Bluffs, Omaha, Yankton, below Fort Randall Dam, Fort Randall Reservoir, Chamberlain, Mandan, below Garrison Dam, and Garrison Reservoir. At Pierre, Mobridge, and above Garrison Reservoir sampling was monthly or semimonthly. Laboratory chemical analyses were performed on biweekly samples at all stations except above Garrison Reservoir, where they were at monthly intervals. No laboratory chemical tests were run at Mobridge, and total phosphorous and organic nitrogen analyses were not performed at Omaha. Due to the late start of the sampling program (October 1954), the Council Bluffs data are represented only by plankton records.

PB-217 685
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Technical Support Lab.
SANITARY BACTERIOLOGY OF THE UPPER POTOMAC ESTUARY.
Technical rept. no. 6,
Donald W. Lear, Jr., and Norbert A. Jaworski.
Mar 69, 40p

Descriptors: (*Potomac River Basin, *Water pollution), Bacteria, Salmonella, Tables (Data).
Identifiers: *Water quality data.

As part of the Chesapeake Bay-Susquehanna River Basins Project, the Chesapeake Field Station undertook extensive field investigations to

determine the water quality in the Potomac River Basin. A study was initiated in winter 1967 to: 1. Determine the bacteriological water quality of the upper Potomac Estuary: 2. Relate bacterial distributions to other water quality parameters; 3. Evaluate an isolation procedure for Salmonellae; 4. Relate the comparative usefulness of coliforms, fecal coliforms, fecal streptococci and Salmonellae as water quality indicators; and 5. Identify probable sources of bacterial pollution in the area.

PB-217 686
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
WATER QUALITY AND POLLUTION CONTROL STUDY, PATUXENT RIVER BASIN.

May 67, 63p CB-SRBP-Working Document-15

Descriptors: (*Patuxent River Basin, *Water pollution), (*Maryland, Water pollution).

Contents: Immediate pollution control needs: (Waste treatment, Flow regulation, Special studies, Institutional practices); Recent pollution control progress; Description of the study area; Existing water quality: (Biochemical oxygen demand and dissolved oxygen, Nutrients, Bacteriological quality, Dissolved solids); Recent progress in pollution control; Immediate water pollution control needs: (Treatment requirements, Flow regulation, System cost, Transportation to estuary and estuarine consideration).

PB-217 687
Federal Water Pollution Control Administration, Needham Heights, Mass. New England Basins Office.
STATE OF CONNECTICUT SHELLFISH ATLAS.
Feb 70, 109p CWT-10-12

Descriptors: (*Fishing grounds, Connecticut), (*Shellfish, *Connecticut), Atlases, Maps, New England, Estuaries.

The map collection represents the first phase of the Connecticut State Shellfish Atlas, which was designed to locate and identify the shellfish grounds in the estuarine waters of the State of Connecticut. Atlas-designated areas show only those grounds believed to support and produce shellfish of commercial and sport fisheries value and do not show historically productive but presently inactive shellfish areas. Of the leased grounds charted by the Connecticut State Shell Fish Commission, only the active portions were recorded. The coast of Connecticut includes varied species of shellfish but some in only limited numbers such as razor clams, mussels, soft clams, surf clams and ocean quahogs. These pockets of shellfish were not recorded due to their small size and limited value. Shellfish beds were located and identified in all waters regardless of classification: closed shellfish areas prohibiting harvesting, and open areas, as well as conditionally approved classifications.

PB-217 688
Halliburton Co., Duncan, Okla.
FEASIBILITY STUDY ON THE APPLICATION OF VARIOUS GROUTING AGENTS, TECHNIQUES AND METHODS TO THE ABATEMENT OF MINE DRAINAGE POLLUTION. PART III. PLANS, SPECIFICATIONS AND SCHEDULES FOR REMEDIAL CONSTRUCTION AT MINE NO. 12-007A, MINE NO. 62-067, MINES NO. 64-014, 64-016, AND 64-017.
30 Nov 67, 425p
Contract DI-14-13-31
Report on Monongahela River Mine Drainage Remedial Project, Upper West Fork River Subbasin, West Virginia. See also PB-216 238 and PB-216 249.

Descriptors: (*Mine waters, *Water pollution), (*Monongahela River, Mine waters), (*Coal mines, Sealing), Cost estimates, West Virginia.
Identifiers: *Mine acid drainage, *Water pollution control.

The report is a continuation of previous reports concerning the studies and investigations performed in the exploration of drift mines and feasibility studies into the application of materials and material placement techniques toward the abatement of mine drainage pollution. Twenty drift mine sites were selected previously. Report II studies them. In the present report, 3 of those 20 mines were further studied. Detailed plans, specifications, and schedules for contracting and construction of pollution abatement remedial measures for each of the three selected sites is presented. This includes a general description of the three selected mines, the schedule, cost estimate and recommendations for each mine site, and the plans and specification sections for each mine.

PB-217 689
Environmental Health Center, Cincinnati, Ohio.
ANNUAL REVIEW OF LITERATURE, 1951. I. STREAM POLLUTION. II. ANALYTICAL METHODS. III. RADIOACTIVE WASTES,
M. B. Ettinger, P. D. Haney, R. L. Harris, W. Allen Moore, and Lloyd R. Setter. Feb 52, 110p

Descriptors: (*Water pollution, *Reviews), Aquatic microbiology, Bacteria, Aquatic biology, Biochemical oxygen demand, Water analysis, Radioactive contaminants.

Contents:
Stream pollution--Abatement and control, bacteriology, biology, B.O.D. and chemistry, standard, surveys and studies;
Analytical methods;
Radioactive wastes-- the problem, radiation safety, emergency measures and decontamination, waste treatment, incineration and the stack gas problem, biological effects, natural (Background) radioactivity, analytical methods, instrumentation.

PB-217 690
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE AIR POLLUTION PROBLEM IN STEUBENVILLE, OHIO,
Jean J. Schueneman, and Samuel Rogers. Dec 56, 31p

Descriptors: (*Air pollution, *Ohio).
Identifiers: *Steubenville (Ohio).

Contents: General description of the area (geography, population, industrial and commercial activity, meteorology, land use); Sources of pollution (industry and commerce, general public, transportation); The air pollution problem; Air pollution control (official agencies concerned, ordinances and laws); Suggested approach to the problem (inventory of pollution emissions, enforcement of existing laws, possible alternatives for control regime, unified area effort).

PB-217 691
Environmental Health Center, Cincinnati, Ohio.
APPLICATION OF BIOLOGICAL METHODS IN THE TREATMENT OF RADIOACTIVE WASTES,
C. C. Ruchhoft, and L. R. Setter. 26 Jun 52, 36p
Presented at the Central States Sewage and Industrial Wastes Associations Meeting, Madison, Wis., 26 Jun 52.

Descriptors: (*Radioactive waste processing, *Activated sludge process).

The paper reviews some general aspects of the radioactive waste disposal problems and points out the possibilities of the use of biological methods in the treatment of such wastes. The paper does not go into details as to the fundamental principles of radiation or all phases of radioactive waste problems.

PB-217 692
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AN APPRAISAL OF THE AIR RESOURCES OF METROPOLITAN BALTIMORE,
John M. Brown, and F. Donald Maddox. Jun 65, 111p SEC-TR-A65-33

Descriptors: (*Maryland, *Air pollution), Sources, Abatement.
Identifiers: *Baltimore (Maryland), *Air quality data.

The Baltimore metropolitan area, like all metropolitan areas in the United States, has experienced unprecedented growth in recent years. Such growth will be accompanied by multiplied problems of urban living. Among the continuing problems will be air pollution. Industrial emissions add to unsatisfactory levels of pollutants. The individual's automobile is part of one of the largest, most offensive groups of air pollution sources. At present, particulate pollutants are a problem. Sulfur dioxide levels have been reduced recently, but remain a potential problem. During summers, Los Angeles-type photochemical smog has appeared as indicated by hydrocarbon and oxidant levels measured. Higher nitrogen oxide and carbon monoxide levels can be expected in the future as a result of the lack of control of nitrogen oxide emissions and the anticipated increase in automobile use. Recommendations are set forth for effective control authority and regulations throughout the metropolitan area.

PB-217 693
Public Health Service, Washington, D. C. Div. of Water Supply and Pollution Control.
REPORT ON EFFLUENT DISPOSAL CONSIDERATIONS IN POSSIBLE PULP AND PAPER MILL DEVELOPMENTS IN SOUTHEASTERN MISSOURI.

1960, 201p

Descriptors: (*Missouri, *Water pollution), (*Paper industry, Water pollution), Industrial wastes, Water quality.

The report sets forth information obtained in a preliminary effluent disposal study of certain river basin areas which have been suggested as possible locations for pulp and paper mills in the southeastern portion of the State of Missouri. The river basins involved in the study were Gasconade, Current, Black, St. Francis, Big, and Meramec Rivers and the portion of the Mississippi River from Sainte Genevieve to New Madrid, Missouri. The survey of mill sites was made in keeping with the request and interest shown by the Missouri Water Pollution Board and other State and Federal agencies.

PB-217 694
Public Health Service, New York. Div. of Water Supply and Pollution Control.
DELAWARE ESTUARY COMPREHENSIVE STUDY. PROGRAM REVIEW.
Jan 64, 39p
See also report dated Sep 63, PB-217 695.

Descriptors: (*Delaware Estuary, *Water resources), Water pollution, Project planning.

The Delaware Estuary Comprehensive Study is concerned with developing a comprehensive program for the management of the water quality of the Estuary. The project will provide a set of techniques that will afford the opportunity to describe the variation of quality in the future,

make rational and technically well-founded decisions on alternatives to control the quality and finally to accomplish these aims within a given economic environment.

PB-217 695
Public Health Service, New York. Div. of Water Supply and Pollution Control.
DELAWARE ESTUARY COMPREHENSIVE STUDY.
Sep 63, 39p
See also report dated Jan 64, PB-217 694.

Descriptors: (*Delaware Estuary, *Water pollution), (*Pennsylvania, Water pollution), (*Delaware, Water pollution).
Identifiers: *Water quality data.

The report covers four specific areas related to the existing interstate standards for control of pollution in the Delaware River Basin. These four areas are: (1) present water quality condition of the Estuary; (2) present degree of compliance with the quantitative aspects of the interstate standards; (3) effect on the quality of the river if literal compliance with the quantitative aspects of the standards were adhered to everywhere; and (4) estimates of what changes must be sought in present levels of waste treatment to meet the 50% DO saturation goal set by the standards for Zone III (Pennypack Creek to the Pennsylvania-Delaware State Line.

PB-217 696
Federal Water Pollution Control Administration, Kansas City, Mo. Missouri Basin Region.
PROCEEDINGS OF ANIMAL WASTE MANAGEMENT CONFERENCE HELD IN KANSAS CITY, MISSOURI ON FEBRUARY 20, 1969.

Feb 69, 42p

Descriptors: (*Agricultural wastes, *Water pollution), Livestock.
Identifiers: *Water pollution control, Manure, *Feedlot wastes.

The study includes reports for effective programs for abatement of animal feedlot wastes. The role of industry and feedlot waste management and pollution described control is included in the conference.

PB-217 697
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
PROGRAM REVIEW. MISSOURI-SOURIS-RED RIVER BASIN COMPREHENSIVE PROJECT.

Jan 66, 100p
See also PB-217 900.

Descriptors: (*Missouri River Basin, *Water pollution), (*Souris River Basin, *Water pollution), (*Red River Basin, *Water pollution), Project planning.

The study plan represents background material required for a program review of the Missouri-Souris-Red River Basins Project. It contains information relative to budget, personnel, administrative and operational procedures likely to be encountered during the duration of the project.

PB-217 698
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
NIOBRARA RIVER BASIN (INCLUDING PONCA CREEK VALLEY) WATER POLLUTION INVESTIGATION.
Sep 50, 96p
Prepared in cooperation with Bureau of Reclamation, Region 7 and Water Pollution Control agencies of Nebraska, South Dakota, and Wyoming. Report dated Jan 51 on cover.

Descriptors: (*Niobrara River Basin, * /ater pollution), (*Nebraska, Water pollution), (*South Dakota, Water pollution).

The bureau of Reclamation believed it necessary that basin-wide studies of stream pollution be conducted to establish base data for use in planning maximum water utilization; to document the extent and nature of existing pollution; and to record general standards of water quality. Sanitary engineers detailed to the Lower Platte River Basin Study by the Nebraska State Health Department and the Public Health Service included the Niobrara River Basin and Ponca Creek Valley in their investigations. A mobile laboratory unit was moved to Ainsworth, Nebraska, in the Niobrara River Basin, June 8, 1949. The report contains reviews of State water pollution control laws, laboratory results, presentation of data, discussion, conclusions and recommendations. An appendix is included for individual laboratory and flow data.

PB-217 699
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio. Cincinnati Water Research Lab.
REMOVAL OF PHOSPHATE FROM WASTEWATER BY ALUMINUM SALTS WITH SUBSEQUENT ALUMINUM RECOVERY,
J. B. Farrell, B. V. Salotto, R. D. Dean, and W. E. Tolliver. 1968, 8p
Pub. in Chemical Engineering Progress Symposium Series, v64 n90 p232-239 1968.

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Chemical removal (Sewage treatment), *Phosphorus), (*Alums, Sewage treatment), Precipitation (Chemistry), Aluminum sulfates, Inorganic phosphates.

The paper describes procedures and reports results of experiments investigating the removal of phosphates from waste water by alum addition.

PB-217 700
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
EFFICIENCY STUDY OF THE DISTRICT OF COLUMBIA WATER POLLUTION CONTROL PLANT.
Feb 67, 20p CB-SRBP-Working Document-7

Descriptors: (*District of Columbia, *Sewage treatment), Chemical composition, Outfalls.
Identifiers: Sewage treatment effluents.

An operational efficiency study of the District of Columbia Water Pollution Control Plant was made on November 9, 10, and 11, 1966. The purpose of the study was to verify the results of a daily composite sampling program carried out by the District of Columbia Department of Sanitary Engineering in order to establish the reliability of this data as input to a mathematical model of the Potomac Estuary. Total phosphates were also measured in order to determine the operational efficiency of a conventionally operated, large activated sludge plant in removing this nutrient.

PB-217 701
Federal Water Pollution Control Administration, Fresno, Calif. San Joaquin Project.
TREATMENT OF HIGH NITRATE WATERS,
Percy P. St. Amant, and Perry L. McCarty. 1969, 19p
Presented at the Annual Conference, American Water Works Association (89th), San Diego, Calif. 21 May 69.

Descriptors: (*Water treatment, Chemical removal (Water treatment)), (*Chemical removal (Water treatment), *Inorganic nitrates), Anaerobic processes, Pilot plants.
Identifiers: Return flow, *Denitrification.

The U.S. Public Health Service Drinking Water Standards of 1962 recommend that nitrates in drinking water be limited to 45 milligrams per liter. This limit has been set because of the association of high nitrates in water with the incidents of methemoglobinemia in infants. The results of investigations on the removal of nitrates from irrigation return waters in the San Joaquin Valley in California have indicated that biological denitrification may be an economically feasible way to remove nitrates. The purpose has been to develop methods to control the discharge of undesirable quantities of nitrates into the San Francisco Bay System rather than to develop a process for nitrate removal from a municipal water supply. However, of the several processes studied, biological denitrification in filter beds has proved to have the stability and efficiency of operation that would be necessary for treatment of a drinking water supply. The paper contains a summary of the pilot-plant studies which were conducted to estimate chemical requirements, to evaluate possible filter media, and to determine the important operating parameters.

PB-217 702
Environmental Protection Agency, Cincinnati, Ohio. Water Quality Office.
MACROINVERTIBRATE COLLECTIONS AND WATER QUALITY MONITORING IN THE OHIO RIVER BASIN, 1963 - 1967.
William T. Mason, Jr., Philip A. Lewis, and J. B. Anderson. Mar 71, 224p

Descriptors: (*Ohio River Basin, *Biological surveys), (*Water pollution, Ohio River Basin), Invertebrates, Seasonal variations.
Identifiers: *Water pollution effects (Animals).

Macroinvertebrate populations were sampled at fourteen Ohio River and tributary stations over a five year period, 1963-1967. Selected physical and chemical surveillance data were related to biological quality. Ohio River stations included; Pittsburgh, Pennsylvania, Toronto, Marietta and Addison, Ohio, Huntington, West Virginia, Cincinnati, Ohio, Louisville, Kentucky, Evansville, Indiana and Cairo, Illinois. Population characteristics and trends in cyclic periods of abundance of certain species at the stations were found to be of utmost importance in evaluating effects of pollution on macroinvertebrates. (Author Modified Abstracts)

PB-217 703
Eastern Illinois Univ., Charleston. Dept. of Zoology.
THE RESISTANCE OF TUBIFICID WORMS TO THREE COMMON POLLUTANTS,
L. Stephen Whitley. 29 May 67, 15p
Grant PHS-WP-00937-02
Pub. in Separatum Vol 32 Fasc 1-2, 19 Aug 68.

Descriptors: (*Worms, *Water pollution), (*Aquatic animals, Worms), Tolerances (Physiology), Metals, Lead (Metals), Zinc, Ecology, Physiology.
Identifiers: *Tubificidae, Tubifex tubifex, Limnodrilus hoffmeisteri, Pentachlorophenal, *Water pollution effects (Animals).

The family Tubificidae are characterized as 'small aquatic worms, up to 200 mm in length, with setae in four bundles per segment, with usually an interminate number of setae per bundle.' The family Tubificidae according to present systematic studies contains approximately eighteen genera. Representatives of two of the genera, Limnodrilus and Tubifex are the most commonly found types. Tubificids have a reputation for resistance to pollutants. The common name of 'sludge worms' attest to that. However, no quantitative work on the extent of this resistance has been carried out. For a term such as 'tolerant' to have meaning, some quantification must be carried out under standard laboratory procedures. This report presents some data from such procedures and is an attempt to quantify the tolerance of tubificid worms to three common types of pollutants, the metals, lead and

zinc and the wood preservative, sodium pentochlorophenol.

PB-217 704
Environmental Control Administration, Cincinnati, Ohio.
PERFORMANCE TESTS FOR PLATE HEAT EXCHANGERS USED FOR ULTRA-HIGH-TEMPERATURE PASTEURIZATION PROCESSES,
R. W. Dickerson Jr., R. B. Read Jr., and H. E. Thompson Jr. 1968, 21p PHS-999-UIH-12

Descriptors: (*Pasteurizing, *Heat exchangers), (*Milk, Pasteurizing).

Most of the tests employed to measure the performance of ultra-high-temperature pasteurizers are the same as those used for high-temperature, short-time pasteurizers; the only changes are in the procedures for measuring holding time and the speed of response of the control system. Methods for measuring holding time and control response time are presented in the same format as those recommended in the Public Health Service's Grade 'A' Pasteurized Milk Ordinance. (Author)

PB-217 705
Public Health Service, Washington, D.C.
REPORT ON PROPOSED STREAM POLLUTION STUDIES OF THE KANSAS RIVER WITH RECOMMENDATIONS ON THE PROCEDURE TO BE ADOPTED,
H. H. Wagenhals. Nov 21, 9p

Descriptors: (*Kansas River, *Water pollution.

The report concerns a study of the Kansas River and its tributaries to ascertain their condition, the effect of the sewage being discharged into them at the present time, their probable capacity to receive sewage with due regard to the rights of cities desiring to use it as a source of water supply, and the extent of sewage treatment required to maintain the rivers in proper condition for their use as a water supply.

PB-217 706
Environmental Health Center, Cincinnati, Ohio.
ROLLING MILLS: AN INDUSTRIAL WASTE GUIDE TO STEEL ROLLING MILLS.
1951, 63p

Descriptors: (*Rolling mills, *Industrial wastes), (*Iron and steel industry, Water pollution), (*Water pollution, Industrial wastes), Pickling compositions, Iron, Scale (Corrosion), Oils, Acidity, Metal finishing.

Liquid industrial wastes of the rolling operations are roll-cooling water, descaling water, and waste pickle liquor. The principal pollutional features of these wastes are suspended solids, oil, grease, acid, and soluble iron. The suspended solids are fine particles of iron oxide (mill scale) which are removed from the surface of the product in the process. A description is presented of the processes with emphasis on operations producing liquid wastes is presented. Information on the volume and character of the wastes is given. Measures which remedy or abate the liquid waste problems of the industry are discussed.

PB-217 707
Robert A. Taft Water Research Center, Cincinnati, Ohio.
RESEARCH ON AIR POLLUTION ASPECTS OF INCINERATION,
Robert L. Stenburg. 1957, 12p

Descriptors: (*Incinerators, *Air pollution).

The report describes research to be conducted with a small scale multiple chamber incinerator.

PB-217 708
Robert A. Taft Water Research Center, Cincinnati, Ohio.
MAJOR ENVIRONMENTAL PROBLEMS AND RESEARCH PROGRESS,
H. G. Hanson. 1957, 17p
Presented at the Health Conference (6th), University Park, Pa., 18-22 Aug 57.

Descriptors: (*Public health, *Pollution).

Problems are many and most of the newer ones requiring intensive research are: Research to develop measurement techniques to determine the specific nature, source, concentration, and interaction of environmental contaminants;Research to define the health effects of environmental influences, and to point the way to intelligent preventive of control measures; and Research to develop necessary remedial measures when cause and effect relationships are known.

PB-217 709
Robert A. Taft Water Research Center, Cincinnati, Ohio.
EMERGENCY REUSE OF WATER AT CHANUTE, KANSAS, 1956-57,
Dwight F. Metzler, Rullell L. Culp, Richard L. Woodward, Graham Walton, and Shih Lu Chang. 1957, 70p

Descriptors: (*Sewage treatment, *Water reclamation), Water supply, Potable water, Kansas.
Identifiers: *Chanute (Kansas).

From October, 1956 to March, 1957 the City of Chanute, Kansas, (population 12,000) faced with a critical water shortage, resorted to use of its sewage as a source of water supply. The paper reports on the treatment methods used, some of the problems which arose, and the water quality studies which were made during the period of water recirculation. No adverse effects on the health of the people were noted but much of the population used other sources of drinking water because of the various objectionable characteristics of the public supply. (Author)

PB-217 710
Public Health Service, Washington, D.C.
MERAMEC RIVER BASIN: A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM.

1957, 11p PHS-Pub-553 WP-72

Descriptors: (*Meramec River Basin, *Water pollution), (*Missouri, Water pollution).

The report summarizes the 'Comprehensive Water Pollution Control Program for the Meramec River Drainage Basin' as developed by the Missouri Division of Health and the Public Health Service of the U.S. Department of Health, Education, and Welfare. The program gives full consideration to the several present uses and to the reasonably anticipated future uses of the waters of the basin. It provides an equitable balance in the pollution control requirements for various private and public groups concerned. This program is based on beneficial water uses and related conditions that prevailed on July 1, 1956.

PB-217 711
Public Health Service, Washington, D.C.
DIGEST OF TENNESSEE WATER POLLUTION CONTROL LEGISLATION.
Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*Tennessee, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as junk disposal,fish protection, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 712
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SUMMARY OF THE CONFERENCE ON ODOR CONTROL,
Arthur C. Stern. 1956, 7p
Presented at the Metropolitan Conference on Air Pollution: Odor Control, Cincinnati, Ohio. 25 Oct 56.

Descriptors: (*Air pollution, *Odor control), (*Ohio, Odor control).
Identifiers: *Cincinnati (Ohio).

The report presents an overview of the causes and characteristics of odor pollution and gives recommendations for dealing with the problem. Cincinnati, Ohio is used as the specific example.

PB-217 713
Public Health Service, Washington, D. C. Div. of Sanitary Engineering Services.
A REVIEW AND APPRASIAL OF AIR POLLUTION LEGISLATION IN THE UNITED SATES,
Samuel M. Rogers. 1957, 37p

Descriptors: (*Air pollution, *Legislation), (*Urban areas, Air pollution), Regulation, Law enforcement, Reviews.

The legislative materials utilized for this review were obtained in response to a questionnaire distributed in the early part of 1956 by the Air Pollution Control Association in connection with the preparation of a 'Directory of Smoke and Air Pollution Control Agencies.' The air pollution legislation of 110 cities forms the basis of this review. In addition, certain aspects of air pollution legislation in seven states are briefly presented.

PB-217 714
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
DUST RETENTION EFFICIENCIES OF DUSTFALL COLLECTORS,
John S. Nader. 1957, 16p
Presented at Golden Jubilee Meeting of Air Pollution Control Association, June 4, 1957, St. Louis, Mo.

Descriptors: (*Dust, *Samplers), (*Air pollution, *Particles).

Dustfall collectors representing three collection techniques were exposed to atmospheric dustfall under weather conditions typical of a temperate climate. A statistical evaluation of the gravimetric analysis data and the dust retention efficiencies shows no significant differences among the three types of collections.

PB-217 715
Robert A. Taft Sanitary Engineering Center. Cincinnati, Ohio.
ALGAE AND WATER SUPPLIES IN THE SAO PAULO AREA.
Technical rept.,
C. Mervin Palmer. 1961, 9p SEC-TR-W61-30

Descriptors: (*Water pollution, *Brazil), (*Algae, Water pollution), Surveys, Toxicity, Data acquisition, Recommendations.
Identifiers: *Sao Paulo (Brazil).

As part of a three-month assignment in Brazil the writer was requested to make a study of the algae

in the sources of the public water supplies of the Sao Paulo area. Advice was also desired on the possible significance of any potentially toxic algae. Finally, recommendations were requested concerning methods of preventing and controlling problems caused by algae.

PB-217 716
Public Health Service, Washington, D.C.
DIGEST OF SOUTH DAKOTA WATER POLLUTION CONTROL LEGISLATION.

Sep 58, 7p

Descriptors: (*Water pollution, *Legislation), (*South Dakota, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as explosives, fishing, wilful contaminations, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 717
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
REPORT ON POLLUTION OF THE HUDSON RIVER AND ITS TRIBUTARIES.
Sep 65, 100p
Errata sheet inserted.

Descriptors: (*Hudson River Basin, *Water pollution), (*New York, Water pollution).

The Hudson River has served as a major resource for the population centers along its shores, providing water supply, an abundant fishery, waterborne commerce, a place for recreation and the simple amenity of being by the river side. The survival of New York City, the surrounding metropolitan areas, and the urban areas upstream, depends upon the restoration and the preservation of these most vital water uses. The area covered in this report is the Hudson River and its tributaries from the Federal dam at Troy to the Narrows in New York City. The contents include: Description of area; Water uses; Classification and status of programs; Sources of waste; Effects of pollution on water quality and uses; New York State classes and quality standards applicable to designated waters; Interstate sanitation commission classes and quality standards applicable to designated waters; Status of discharges in New York State area of the Hudson River as reported by New York State Health Department; and Pollution trends in the Hudson River at a point below Poughkeepsie, N.Y. Water Pollution Surveillance Station No. 18.

PB-217 718
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... WYOMING.
Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*Wyoming, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, industrial camps, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 719
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION ... TEXAS.
Sep 58, 7p

Descriptors: (*Water pollution, *Legislation), (*Texas, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as oil well operation, poisonous substances, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 720
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
IMMEDIATE WATER POLLUTION CONTROL NEEDS. CENTRAL WESTERN SHORE OF CHESAPEAKE BAY AREA (MAGOTHY, SEVERN, SOUTH, AND WEST RIVER DRAINAGE AREAS).
Jul 67, 23p CB-SRBP-Working Document-18

Descriptors: (*Chesapeake Bay, *Water pollution), (*Maryland, Water pollution).
Identifiers: *Annapolis (Maryland), *Calvert County (Maryland), *Anne Arundel County (Maryland).

The purpose of the report is to direct attention to existing and potential water pollution problems in the Annapolis Metropolitan Area. This report is intended to summarize immediate pollution control problems and needs and to provide a framework for the more detailed studies needed in a comprehensive program of water quality control.

PB-217 721
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
EVALUATION OF WATER QUALITY TRENDS SHENANDOAH RIVER, VIRGINIA, FRONT ROYAL TO BERRYVILLE.
Technical rept. no. 2,
John W. Baumeister. Dec 68, 29p

Descriptors: (*Shenandoah River, *Water pollution), (*Virginia, Water pollution).

The report contains the findings of the evaluation of water quality trends in the Shenandoah River. The physical, chemical and biological investigation was obtained from several sources. These include data collected at the Federal Water Pollution Control Administration Water Pollution Surveillance System Station at the Corps of Engineers facility, reports published by the U. S. Fish and Wildlife Service, Virginia Commission of Game and Inland Fisheries, and the Virginia State Water Control Board.

PB-217 722
Public Health Service, Dallas, Tex. Region VII.
WATER QUALITY CONSERVATION, ARKANSAS-RED RIVER BASINS. APPENDIX. VOLUME I. THE MINERAL POLLUTION PROBLEM AND PROPOSED SOLUTIONS.
Mar 64, 262p

Descriptors: (*Water pollution, *Arkansas River Basin), (*Water pollution, *Red River Basin), (*Colorado, Water pollution), (*Kansas, Water pollution), (*New Mexico, Water pollution), (*Oklahoma, Water pollution), (*Arkansas, Water pollution), (*Louisiana, Water pollution).
Identifiers: *Water quality data.

Because of the mineral pollution along the Arkansas-Red River Basins, the report describes problems and solutions in order to improve water quality. Study methods through 1962 made by the Public Health Service are included with field studies on stream quality and natural and manmade salt sources.

PB-217 723
Bureau of Waste Management, Rockville, Md.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL (IRGRD). INFORMATION BULLETIN. NUMBERS 13-20, DECEMBER 1961 TO MAY 1964.

1969, 273p
Trans. from International Research Group on Refuse Disposal. Information Bulletin (Switzerland) n13-20 Dec 61-May 64, by Warren L. Armstrong. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: (*Waste disposal, *Periodicals), (*Europe, Waste disposal), (*Composts, Waste disposal), Translations.
Identifiers: *Solid waste disposal.

The report is a compilation of papers concerning the recycling and disposal of sewage and solid wastes. Composting is the major topic.

PB-217 724
National Communicable Disease Center, Atlanta, Ga.
MORPHOLOGY OF DIAGNOSTIC STAGES OF INTESTINAL PARASITES.
Dorothy M. Melvin, and M. M. Brooke. Jun 69, 31p PHS-Pub-1966

Descriptors: (*Parasites, *Intestines), Life cycles, Diagnosis, Morphology, Protozoa, Worms, Medical laboratories, Tests.

The diagnostic stages of intestinal parasites are differentiated on the basis of specific morphologic features which can be seen microscopically. Some of the parasites listed occur only infrequently or accidentally in man; but, since their diagnostic stages may be confused with those of the more common organisms, they have been included here. For example, Entamoeba polecki is rarely found in human feces; however, it closely resembles Entamoeba histolytica and Entamoeba coli, and microscopists unaware of its existence may mistake it for these species. Likewise, several helminth species of lower animals which occasionally parasitize man are included. The diagnostic stages may be misidentified. For example, Trichostrongylus (Nematode) eggs may be confused with hookworm eggs, and Hymenolepis diminuta (Cestode) eggs may be confused with Hymenolepis nana eggs.

PB-217 726
Federal Water Pollution Control Administration, Lawrence, Mass. Merrimack River Project.
REPORT ON POLLUTION OF THE MERRIMACK RIVER AND CERTAIN TRIBUTARIES. PART II. STREAM-STUDIES, PHYSICAL, CHEMICAL, AND BACTERIOLOGICAL.
Herbert R. Pahren, Donald R. Smith, Myron O. Knudson, Charles D. Larson, and Howard S. Davis. Aug 66, 239p
See also Part 3, PB-217 970.

Descriptors: (*Merrimack River Basin, *Water pollution), (*New Hampshire, Water pollution), (*Maine, Water pollution).

Identifiers: *Water quality data.

Contents: Sources of pollution; Water uses; Time of stream travel; Effects of pollution of stream quality (temperature, dissolved oxygen, biochemical oxygen demand, bacteria, bacterial decline, bacteria on vegetables, salmonella, bacteria in the estuary, nitrogen and phosphorus, industrial wastes, chlorides, tributaries); Oxygen by photosynthesis; Sludge deposits; Oxygen balance studies; Future water quality; Summary and conclusions (study area, pollution sources, water uses, effects of pollution on water quality).

PB-217 727
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Field Station.
COOPERATIVE BACTERIOLOGICAL STUDY UPPER CHESAPEAKE BAY DREDGING SPOIL DISPOSAL.

1968, 15p
Prepared in cooperation with Maryland Univ., Solomons. Natural Resources Inst., Cruise Rept. No. II.

Descriptors: (*Chesapeake Bay, *Water pollution), (*Waste disposal, Chesapeake Bay), (*Spoil, Water pollution), Dredging, Bacteria, Biological surveys.
Identifiers: *Solid waste disposal.

The joint investigation was conducted to determine the effects of current overboard disposal of dredging spoil on the ecology of the Bay in the shipping channel between Baltimore and the Chesapeake and Delaware Canal. Bacteriological capability was furnished by the Chesapeake Field Station, Field Water Pollution Control Station, while all other aspects of the program were accomplished by the Chesapeake Biological Laboratory.

PB-217 728
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION. WASHINGTON.

Sep 58, 15p

Descriptors: (*Water pollution, *Legislation), (*Washington (State), Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as watershed development, wilful damage, ship ballast discharge, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 729
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION: VIRGINIA.
Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*Virginia, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as industrial wastes, fishing, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 730
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION. UTAH.
Sep 58, 12p

Descriptors: (*Water pollution, *Legislation), (*Utah, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as wildlife conservation, industrial wastes, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 731
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION: VERMONT.
Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*Vermont, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as mills, recreational facilities, food crop irrigation, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 732
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION: ALABAMA.
Sep 58, 16p

Descriptors: (*Water pollution, *Legislation), (*Alabama, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as dead animal disposition, construction, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 733
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION: SOUTH CAROLINA.
Sep 58, 12p

Descriptors: (*Water pollution, *Legislation), (*South Carolina, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as well operation, harbor protection, fishing, urban health, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 734
Public Health Service, Washington, D.C.
DIGEST OF WATER POLLUTION CONTROL LEGISLATION: PUERTO RICO.
Sep 58, 7p

Descriptors: (*Water pollution, *Legislation), (*Puerto Rico, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fish and shellfish conservation, slaughterhouses, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 735
Public Health Service, Washington, D.C.
DIGEST OF PENNSYLVANIA WATER POLLUTION CONTROL LEGISLATION.
Sep 58, 11p

Descriptors: (*Water pollution, *Legislation), (*Pennsylvania, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as living quarters, fishing, mining, and the portection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 736
Public Health Service, Washington, D.C.
DIGEST OF VIRGIN ISLANDS WATER POLLUTION CONTROL LEGISLATION.
Sep 58, 6p

Descriptors: (*Water pollution, *Legislation), (*Virgin Islands, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as household sewage, wells, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 737
Public Health Service, Washington, D.C.

DIGEST OF WISCONSIN WATER POLLUTION CONTROL LEGISLATION.
Sep 58, 9p

Descriptors: (*Water pollution, *Legislation), (*Wisconsin, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fishing, cesspools, industrial wastes, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 758
Public Health Service, Washington, D.C.
DIGEST OF WEST VIRGINIA WATER POLLUTION LEGISLATION.
Sep 58, 9p

Descriptors: (*Water pollution, *Legislation), (*West virginia, Water pollution).

The report outlines the composition, requirements, and duties of the state pollution control board. Provisions are described for the issuance of waste or sewage disposal permits, the review of plans and specifications for facilities, and the establishing of procedures to handle violations. Listed are the authorizations to set rules and regulations in such areas as fishing, mining, and the protection of streams and underground waters; to suppress disease and unsanitary practices; and to prevent water supply pollution in general. Authority is given to abate public nuisances by legal proceedings.

PB-217 759
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Technical Support Lab.
THE POTOMAC ESTUARY MATHEMATICAL MODEL.
Technical rept. no. 7,
Leo J. Hetling, Johan A. Aalto, Norbert A. Jaworski, and Donald W. Lear, Jr. Mar 69, 24p

Descriptors: (*Potomac Estuary, *Mathematical models), Chemical composition, Hydrography.

A systems analysis approach has been undertaken in investigating the water quality responses in the Potomac River Basin. The analyses included the effects of low flow augmentation, wastewater diversions, water supply withdrawals, and increased degrees of wastewater treatment on water quality in the upper estuary. Several techniques or mathematical models capable of simulating the response of water quality in an estuary were available when the study of the Potomac Estuary was undertaken in 1965. After an investigation of the modeling systems available, the segmented estuary model developed by Dr. Robert Thomann was selected as the one which most closely conformed to the requirements of the study. It discusses the verification and uses of this model.

PB-217 760
National Center for Urban and Industrial Health, Chevy Chase, Md. Environmental Sanitation Program.
PROCEDURES MANUAL. DETROIT RIVER--LAKE ERIE PROJECT FIELD OPERATIONS SECTION. SECTION I. PROCEDURES FOR SAMPLING AND HYDROLOGY. SECTION II. STORM WATER OVERFLOW AND DOMESTIC WASTE SURVEYS. BIOLOGICAL STUDIES,
Richard D. Vaughan. 1964, 178p
See also PB-215 856.

Descriptors: (*Detroit River, *Water pollution), (*Lake Erie Basin, *Water pollution), Michigan, Sewage.
Identifiers: Sewage treatment effluent, Storm water runoff.

The objective of the Project was to determine strengths of known sources of wastes and to obtain an accurate picture of quality at any point in the waters under study. A large number of samples were collected and analyzed to yield the physical, chemical, and bactericlogical data necessary to evaluate the waste loading and water quality. A system of sampling was set up to gather data from the Detroit River and tributaries, Michigan part of Lake Erie, beaches, industrial outfalls, and municipal outfalls. Section II presents comprehensive surveys of the six major sewage treatment plants in the Project's study area. These were carried out at various times throughout the summer and fall in cooperation with the Michigan Department of Health to determine the waste loads to the river at different seasons of the year. The plants surveyed were Belle Isle, Detroit, Grosse Ile (Potawatamee Woods Subdivision), Monroe, Trenton, and Wyandotte. (Author)

PB-217 761
Bechtel Corp., San Francisco, Calif.
METHODOLOGY FOR ECONOMIC EVALUATION OF MUNICIPAL WATER SUPPLY/WASTEWATER DISPOSAL INCLUDING CONSIDERATIONS OF SEAWATER DISTILLATION AND WASTEWATER RENOVATION.
Final rept.

Aug 70, 118p
Contract SD-70-2, DI-14-01-0001-2161

Descriptors: (*Desalting, Water supply), (*Sewage treatment, *Urban planning), (*Water treatment, *Urban planning), (*Water supply, Sources), Mathematical models, Cost analysis, Water reclamation.
Identifiers: Waste water reuse.

The report incorporates the results of an investigation to develop computational procedures for determining least-cost water supply and wastewater disposal systems for metropolitan areas. Special attention was given to seawater distillation and wastewater renovation in such determinations. The feasibility of the computational procedure (a mathematical model) was tested by application to a hypothetical coastal city.

PB-217 762
Public Health Service, Dallas, Tex. Region VII.
WATER RESOURCES STUDY LEE CREEK BASIN ARKANSAS AND OKLAHOMA. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER STORAGE FOR MUNICIPAL, INDUSTRIAL AND QUALITY CONTROL PURPOSES.

Aug 64, 42p

Descriptors: (*Lee Creek Basin, *Reservoirs), (*Arkansas, *Water resources), (*Oklahoma, *Water resources), Forecasting.

The report presents the results of an investigation to determine water requirements for municipal and industrial purposes in the area that could be served by the water resources of Lee Creek. Also investigated was the need for and the value of storage for streamflow regulation for water quality control in the Lee Creek study area. Benefits derived from a Federally constructed reservoir to provide for water needs for a 100-year period have been considered.

PB-217 763
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
SAN JOAQUIN MASTER DRAIN. EFFECTS ON WATER QUALITY OF SAN FRANCISCO BAY AND DELTA. APPENDIX PART C. NUTRIENTS AND BIOLOGICAL RESPONSE,
Richard C. Bain, Jr., Herbert E. Pintler, Albert Katko, and Robert F. Minnehan. Aug 68, 162p
Report on Central Pacific Basins Project.

Descriptors: (*San Francisco Bay, *Water pollution), (*San Joaquin River, *Water pollution), Drains, Nutrients, Nitrogen, Phosphorus, Silicon dioxide, Phytoplankton, Agricultural wastes, Fresh water fishes, California.
Identifiers: *Water pollution effects (Plants), *Water pollution effects (Animals).

A federal drain (The San Luis Drain) is currently contemplated in the San Joaquin Valley for the purpose of collecting and transporting highly saline agricultural drainage waters to a disposal point in the Sacramento - San Joaquin Delta near the City of Antioch. The effect of the drain on the quality of the Bay and Delta waters was studied. The future fifty year period, 1970-2020, was examined. The scope of this part of the Appendix is limited to description of effects related to nutrient enrichment of the San Francisco Bay-Delta system including effects on fishery, recreation and shoreline real estate values. Material is presented describing laboratory and field studies, literature surveys on fishery resources and water quality requirements, Bay-Delta water quality and biota, and predictive models leading to economic evaluations.

PB-217 764
Public Health Service, Dallas, Tex. Region VII.
FUTURE MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS QUALITY AND RETURN FLOW ASPECTS IN THE NECHES, TRINITY, SAN JACINTO, BRAZOS, COLORADO, GUADALUPE, SAN ANTONIO, AND NUECES RIVER BASINS.

Jan 62, 125p Work Assignment-33

Descriptors: (*Neches River Basin, *Water pollution), (*Trinity River Basin, *Water pollution), (*San Jacinto River Basin, *Water pollution), (*Brazos River Basin, *Water pollution), (*Colorado River Basin, *Water pollution), (*Guadalupe River Basin, *Water pollution), (*San Antonio River Basin, *Water pollution), (*Nueces River Basin, *Water pollution), (*Texas, Water pollution), Forecasting.

The report describes the future quality of water for the year 2010 in the United States Study Commission - Texas area and determines the amounts of augmentation water required to maintain the water quality criteria adopted by the Commission. The report is to serve as a guide in determining and locating points and reaches in the eight river basins under study that may need water for water quality control. This report does not specify sources of water to be used for quality control. The study and analysis of the river basins and adjoining areas show a total need of 827,920 acre-feet of augmentation water to control the deficiency in dissolved oxygen.

PB-217 765
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
THE NATION AND ITS WATER RESOURCES,
Leonard B. Dworsky. May 62, 175p

Descriptors: (*United States, *Water resources), History.

Contents:
The Waterways--Atlantic to Pacific;
The Colonies;
1776-1865: (Water supply, Navigation, Gallatin and internal improvements, The Supreme Court, Early federal aid, Internal improvements);
1865-1900: (Scientific developments, Industrial development, Power, Urbanization, public

health, and water supply, Internal improvements, The second opening of the west);
1900-1960: (Conservation, Public health, Metropolitanism and industrialization, Water resources development).

PB-217 766
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY. WEISNER RIVER DIVISION COUNCIL AND MAIN WEISNER UNITS. SOUTHWEST IDAHO WATER DEVELOPMENT PROJECT, IDAHO.
Jun 66, 32p
Report on Weisner River Basin Project for Water Supply and Quality Control Study.

Descriptors: (*Weisner River Basin, *Reservoirs), (*Idaho, *Water resources), Forecasting.
Identifiers: Washington County (Idaho), Adams County (Idaho).

The investigation was undertaken by the Federal Water Pollution Control Administration to determine the potential need for municipal and industrial water supply and the need for and value of storage in the proposed Southwest Idaho Water Development Project, Weisner River Division, Council and Main Weiser Units, Idaho, for water quality control. Water requirements were examined for areas within Washington and Adams Counties, Idaho. Future needs were projected to the year 1980, 2000, and 2020. An economic base study and forecast of future population and industrial growth was prepared for this purpose and is summarized in this report.

PB-217 767
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE AIR POLLUTION PROBLEM IN PORTLAND, OREGON. REPORT TO THE PORTLAND BUREAU OF HEALTH,
Jean J. Schueneman. Sep 56, 26p

Descriptors: (*Oregon, *Air pollution).
Identifiers: *Portland (Oregon).

There is a feeling of concern in the City of Portland as to the general status of the atmospheric resources of the City and what, if any, additional action is warranted on the part of the City Government with regard to this important part of the public domain. This feeling was evidenced by a request by the Health Officer of the City, endorsed by the State Health Officer, that the public Health Service provide technical advice to enable Portland to coordinate present activities and to develop a logical plan for air pollution control. The report discusses this survey.

PB-217 768
Federal Water Pollution Control Administration, Washington, D.C.
WATER POLLUTION CONTROL TRAINING PROGRAM. BULLETIN OF COURSES, JUL 1967-JUNE 1968.

22 Jan 73, 61p

Descriptors: (*Water pollution, *Education).

The report contains a listing of training courses, relative to water pollution control, offered by United States regional research centers. A description of the facilities available at the centers is included.

PB-217 769
Federal Water Pollution Control Administration, San Francisco, Calif. Southwest Region.
VESSEL POLLUTION STUDY SAN DIEGO BAY, CALIFORNIA.
Jun 69, 67p

Descriptors: (*Ships, Water pollution), (*San Diego Bay, *Water pollution), (*California, Water pollution), Naval ships.

A two-year study in San Diego Bay reveals that vessel waste discharges produce undesirable water quality conditions in areas of concentrated vessel activity. The study examined the effects of waste discharges representative of up to one-fourth of the U.S. Navy's entire active fleet, more than twenty-five hundred pleasure craft containing sanitary facilities, over a hundred ships of the West Coast commercail fishing fleet, and commercial freight vessels carrying in excess of a million tons of cargo to the Port of San Diego each year. Wastes discharged from these vessels were found to create conditions that are hazardous to health, aesthetically offensive and damaging to ecological balances in San Diego Bay. (Author)

PB-217 770
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION CONTROL RESEARCH AND TRAINING GRANTS: LIST OF 1963 AWARDS: RESEARCH GRANTS, RESEARCH FELLOWSHIPS, TRAINING GRANTS, DEMONSTRATION GRANTS.
Jan 64, 43p PHS-Pub-1100-Rev-63

Descriptors: (*Water pollution, *Grants), Research, Education.

The report presents a summary of awards by states and a complete list of the grants and fellowships.

PB-217 771
Federal Water pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY MONITORING NETWORK.
Jan 69, 85p

Descriptors: (*Water pollution, *Pacific Northwest).
Identifiers: *Water pollution sampling.

The report describes the FWPCA-State water quality monitoring network for those interstate streams and associated tributaries located mainly above tidal influence. Covered will be the Snake River Basin (Idaho, Oregon and Washington), the Upper Columbia River Basin above the Yakima River (Washington, Idaho and Montana) and the Lower Columbia River and tributaries from the mouth of the Yakima River to the Pacific Ocean.

PB-217 772
Public Health Service, Dallas, Tex. Region VII.
WATER RESOURCES STUDY, MARKED TREE SIPHON, ST. FRANCIS RIVER BASIN, ARKANSAS. STUDY OF POTENTIAL NEED FOR AND VALUE OF STREAMFLOW REGULATIONS FOR CONTROL OF WATER QUALITY BELOW THE MARKED TREE SIPHON.

Feb 63, 30p

Descriptors: (*Saint Francis River, *Reservoirs), (*Arkansas, *Water resources).

The report presents information and data pertaining to streamflow requirements for water quality control purposes to the year 2020 in the St. Francis River below the Marked Tree Siphon. Estimates are made of the average annual benefits for a period of 50 years that will accrue from works providing necessary flow regulation to meet water quality objectives.

PB-217 773
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR AND WATER POLLUTION STUDIES RELATED TO PROPOSED PETROLEUM REFINERY FOR SAND ISLAND, OAHU, TERRITORY OF HAWAII,
Andrew H. Rose, Jr., Hayse H. Black, and R. C. Wanta. Dec 55, 60p

Descriptors: (*Refineries, *Air pollution), (*Refineries, *Water pollution), (*Hawaii, Pollution), (*Petroleum refining, Pollution), Industrial wastes.

The report contains results obtained from a study of the air and water pollution potential of a petroleum refinery proposed for an island located in Honolulu harbor.

PB-217 776
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
LOWER PLATTE RIVER BASIN WATER POLLUTION INVESTIGATION.
Jun 50, 217p
Prepared in cooperation with the Bureau of Reclamation, Region 7, and the Nebraska State Dept. of Health. Library of Congress Catalog card no. 79-614455.

Descriptors: (*Platte River Basin, *Water pollution), (*Nebraska, Water pollution).

The investigation on the Lower Platte River Basin included: The extent, types and major sources of pollution; A review of existing laws and pending legislation regarding pollution of public waters in the State of Nebraska; Information regarding the bacteriological quality of water at present and proposed diversion points and in existing irrigation canals; minimum stream flows below the reservoirs necessary for water supply and sanitation purposes with present and contemplated pollution; quality of water for municipal and other public uses; possible benefits to pollution abatement by reservoir releases; and, existing plans and further recommendations for pollution abatement.

PB-217 777
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
CONFERENCE IN THE MATTER OF POLLUTION OF THE SOUTH PLATTE RIVER BASIN IN THE STATE OF COLORADO. 2ND SESSION, DENVER, COLORADO, APRIL 27 AND 28, 1966. PROCEEDINGS. VOLUME III.
1966, 335p
See also Volume 2, PB-217 778.

Descriptors: (*Water pollution, *Platte River Basin), (*Colorado, Water pollution), Proceedings.

The report presents results on the following: Determine the legitimate water uses and locate the sources of pollution having an adverse effect on those uses; Through field investigations determine the physical, chemical, and biological responses of the river to pollution and evaluate the previously located sources of pollution with respect to the conditions in the river; and Compute the waste load reductions necessary to obtain desired water quality and recommend water quality control measures needed to effect the desired waste load reductions.

PB-217 778
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
CONFERENCE IN THE MATTER OF POLLUTION OF THE SOUTH PLATTE RIVER BASIN IN THE STATE OF COLORADO. 2ND SESSION, DENVER, COLORADO, APRIL 27 AND 28, 1966. PROCEEDINGS. VOLUME II.
1966, 331p
See also Volume I, PB-217 779, and Volume 3, PB-217 777.

Descriptors: (*Water pollution, *Platte River Basin), (*Colorado, Water pollution), Proceedings.

The report continues the proceedings of a conference on the South Platte's water quality in Colorado.

PB-217 779
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
CONFERENCE IN THE MATTER OF POLLUTION OF THE SOUTH PLATTE RIVER BASIN IN THE STATE OF COLORADO. 2ND SESSION, DENVER, COLORADO, APRIL 27 AND 28, 1966. PROCEEDINGS. VOLUME I.
1966, 282p
Library of Congress Catalog card no. 73-613581.
See also Volume 2, PB-217 779.

Descriptors: (*Water pollution, *Platte River Basin), (*Colorado, Water pollution), Proceedings.

The purpose of the conference is to bring together representatives of the State water pollution control agency, representatives of the United States Department of Health, Education, and Welfare, and other interested parties to review the existing situation, the progress which has been made, to lay a basis for future action by all parties concerned, and to give the State, localities and industries an opportunity to take any indicated remedial action under State and local law.

PB-217 780
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME 2. NORTH ATLANTIC BASIN.
Annual compilation of data 1 Oct 62-30 Sep 63.
30 Sep 63, 121p PHS-Pub-663-Ed-1963-Vol-2

Descriptors: (*Water pollution, *North Atlantic Basin), Tables (Data), Delaware River, Potomac River, Schuylkill River, Shenandoah River, Susquehanna River.
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the North Atlantic Basin. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand, temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 781
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME 3. SOUTHEAST BASIN.
Annual compilation of data 1 Oct 62-30 Sep 63.

30 Sep 63, 109p PHS-Pub-663-Ed-1963-Vol-3

Descriptors: (*Water pollution, *Southeast Basin), Tables (Data), Apalachicola River, Chattahoochee River, Escambia River, Roanoke River, Savannah River, Tombigbee River.
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the Southeast Basin. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand, temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 782
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME 4. WESTERN GREAT LAKES BASIN; LAKE ERIE BASIN.
Annual compilation of data 1 Oct 62-30 Sep 63.

30 Sep 63, 103p PHS-Pub-663-Ed-1963-Vol-4

Descriptors: (*Western Great Lakes Basin, *Water pollution), (*Lake Erie Basin, *Water pollution), Tables (Data), Detroit River, Lake Michigan, Lake Superior, Saint Clair River, Saint Marys River, Cuyahooga River, Maumee River.
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the Western Great Lakes and Lake Erie Basins. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand, temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 783
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME 8. SOUTHWEST-LOWER MISSISSIPPI RIVER BASIN.
Annual compilation of data 1 Oct 62-30 Sep 63.

30 Sep 63, 158p PHS-Pub-663-Ed-1963-Vol-8

Descriptors: (*Southwest Basin, *Water pollution), (*Mississippi River Basin, Water pollution), Tables (Data), Arkansas River, Ouachita River, Red River, Verdigris River.
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the Southwest-Low Mississippi River Basin. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand, temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 784
Federal Water Pollution Control Administration, Cincinnati, Ohio. Div. of Pollution Surveillance.
TRACE METALS IN WATERS OF THE UNITED STATES.
Rept. for 1 Oct 62-30 Sep 67,
John F. Kopp, and Robert C. Kroner. 30 Sep 67, 212p

Descriptors: (*United States, Water pollution), (*Water pollution, *Trace elements), Metals, Tables (Data).
Identifiers: *Water quality data.

Six annual compilations of data from the Federal Water Pollution Control Administration's water quality surveillance program have already been published. The report summarizes the trace element data collected in the five-year period October 1, 1962 through September 30, 1967. The total body of these data includes approximately 30,000 separate determinations. Only one year of those data has been included in a previous publication.

PB-217 785
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
SUMMARY REPORT ON WATER POLLUTION, MISSOURI RIVER DRAINAGE BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.

1951, 242p PHS-Pub-78
Library of Congress Catalog card no. 51-60943.

Descriptors: (*Missouri River Basin, *Water pollution), (*United States, *Water resources).

The report presents information about the ways our water resources are used, the pollution going into our water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, the pollution prevention measures now in effect, and those required. A sincere effort has been made by all who contributed to this report to present a fair picture of the complex water pollution problems in the Missouri Basin and to present reasonable conclusions and recommendations.

PB-217 786
Washington Univ., Seattle.
CHEMICAL ASPECTS OF H2S REMOVAL IN SOIL.
Doctorial thesis,
Robert Clark Gumerman. 1968, 116p
Grant FWPCA-WP-883-03

Descriptors: (*Odor control, Hydrogen sulfide), (*Air pollution, Hydrogen sulfide), (*Soils, *Adsorbents).
Identifiers: *Air pollution control.

Recent applications of a relatively new soil treatment process for the elimination of gaseous malodors emanating from water quality control operations are noted. The study was directed toward an investigation of the chemical aspects of H2S removal by both moist and dry sterile soils. Batch scale tests were utilized to study the effect of temperature on removal efficiency, the ability of a soil to be rejunenated, the desirability of certain common cations in the soil, and selection of an easily measured soil property or characteristic which relates the H2S removal capacity of different soils.

PB-217 787
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
EVALUATION OF COLIFORM CONTRIBUTION BY PLEASURE BOATS.

1966, 22p CB-SRBP-Technical Paper-10

Descriptors: (*Boats, *Water pollution), (*Coliform bacteria, Water pollution), (*Maryland, Water pollution), Recreation.

The report describes a sampling program and presents results and analyses of a study to determine the significance of fecal coliform pollution contributed by pleasure boats. The sampling was conducted on the Miles River on the Eastern Shore of Maryland.

PB-217 788
Public Health Service, Denver, Colo. Region VIII.
WATER RESOURCES STUDY AND PUBLIC HEALTH ASPECTS OF THE BEAR RIVER PROJECT, IDAHO AND UTAH.
Dec 62, 51p

Descriptors: (*Bear River Basin, *Reservoirs), (*Idaho, *Water resources), (*Utah, *Water resources), Forecasting.

The report presents data and information relevant to the determination of water requirements to the year 2060, for the inclusion of storage for regulation of streamflow for the purpose of water quality control in the Lower Bear River Basin, Utah and Idaho. An estimate of the annual benefits which could be ascribed to storage allocated for this purpose is evolved from the projected economic developments and anticipated demands for water supply and stream quality control.

PB-217 789
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
TETON COUNTY (IDAHO) PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960-2010.
14 Dec 62, 10p Working Paper-39
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Columbia River Basin, *Economic development), (*Idaho, Economic development), Forecasting.
Identifiers: *Teton County (Idaho).

Teton County, Idaho, had a 1960 population of 2,639. The main town of the county, Driggs, contained 824 of these, while two smaller towns contained another 434 persons. The remaining population was largely settled in scattered farms. During the 1950-60 decade, population of the county declined 565 persons, or 17.7 percent. This analysis is intended to provide a preliminary estimate of the economic potentials and anticipated growth of the area for the 50-year period 1960-2010, with an interim point at 1985.

PB-217 790
Robert A. Taft Sanitary Engineering Center. Cincinnati, Ohio.
TREATMENT OF WASTES FROM COFFEE PROCESSING IN COSTA RICA,
Herbert R. Pahren, and Rudolfo F. Saenz. 1960, 19p SEC-TR-W60-2

Descriptors: (*Food processing, *Industrial waste treatment), Costa Rica.
Identifiers: *Water pollution control, *Coffee processing.

To determine the feasibility of the treatment of these wastes in stabilization ponds in the country of Costa Rica, a preliminary study was made to learn more about the characteristics of the coffee wastes. Tentative calculations were then made concerning the size of stabilization ponds necessary for these wastes. A brief outline of the information collected is summarized.

PB-217 791
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME L. NORTHEAST BASIN.
Annual compilation of data 1 Oct-63-30 Sep 63.

30 Sep 63, 107p PHS-Pub-663-Ed-1963-Vol-1
Errata sheet included.

Descriptors: (*Northeast Basin, *Water pollution), Connecticut River, Hudson River, Lake Erie, Merrimack River, Raritan River, Saint Lawrence River, Tables (Data).
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the Northeastern United States. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand, temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 792
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME 9. COLORADO RIVER BASIN; WESTERN GULF BASIN.
Annual Compilation of data 1 Oct 62-30 Sep 63.

30 Sep 63, 149p PHS-Pub-663-Ed-1963-Vol-9

Descriptors: (*Water pollution, *Colorado River Basin), (*Western Gulf Basin, *Water pollution), Tables (Data), Animas River, Green River, San Juan River.
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the Colorado and Western Gulf Basins. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand, temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 793
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME 7. MISSOURI RIVER BASIN.
Annual compilation of data 1 Oct 62-30 Sep 63.

30 Sep 63, 166p PHS-Pub-663-Ed-1963-Vol-7

Descriptors: (*Water pollution, *Missouri River Basin), Tables (Data), Big Horn River, Big Sioux River, Kansas River, Missouri River, Platte River, Yellowstone River, North Platte River, South Platte River.
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the Missouri River Basin. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand, temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 794
Public Health Service, Cincinnati, Ohio. Occupational Health Field Headquarters.
SYLLABUS FOR SHORT COURSES FOR INDUSTRIAL HYGIENE ENGINEERS AND CHEMISTS PRESENTED AT OCCUPATIONAL HEALTH FIELD HEADQUARTERS, CINCINNATI, OHIO,
Andrew D. Hosey, Robert G. Keenan, and Charles D. Yaffe. May 58, 363p PHS-Pub-614
Report on the Industrial Environment - Its Evaluation and Control.

Descriptors: (*Air pollution, Handbooks), (*Water pollution, Handbooks), Acoustic measurement, Measurement, Chemical analysis, Noise.
Identifiers: *Air pollution detection, *Water pollution detection.

Contents: General principles in evaluating the occupational environment; A review of sampling instruments used for the collection of air-borne particulates; Gas and vapor sampling and analysis; Direct reading instruments; Air flow calibration of air sampling equipment; Preparation of known concentrations of air contaminants; Sampling and counting dust; The determination of particle size distribution in industrial dust; Determination of nitrogen oxides in air; Application of biochemical methods to occupational health problems; Medical and industrial applications of radiation; Sound and noise; Noise measurement; Illumination and ultraviolet radiation; Comfort ventilation; Engineering control of the occupational environment; Control of noise exposure; Introduction to ventilation airflow; Dilution and general ventilation; Local exhaust systems; Fans; Air cleaning; Airflow measurement; and Ventilation references.

PB-217 795
Public Health Service, Washington, D.C.
A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL FOR THE MINNESOTA RIVER BASIN DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES OF IOWA, MINNESOTA, AND SOUTH DAKOTA.
Water pollution series.

1954, 30P PHS-Pub-365, PHS-WPS-64

Descriptors: (*Minnesota River Basin, *Water pollution), (*Iowa, Water pollution), (*Minnesota, Water pollution), (*South Dakota, Water pollution).

The report, prepared in cooperation with the water pollution control agencies of Iowa, Minnesota, and South Dakota, sets forth the water pollution control program being followed by the respective States in the Minnesota River Basin. This program, which is based on data available as of January 1, 1954, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 796
Massachusetts Health Research Inst., Inc., Westboro.
MASSACHUSETTS PESTICIDE MONITORING STUDY.
Progress rept. no. 3, 15 Jun 67-14 Jun 68,
Lee D. Lyman, William A. Tompkins, and James A. McCann. 1968, 31p
Grant WPD-88-02-67

Descriptors: (*Water pollution, *Pesticides), (*Massachusetts, Water pollution), Fresh water fishes, DDT, Accumulation, Insecticides.
Identifiers: DDE pesticide, *Pesticide residues.

Indigenous fresh water fish species were collected in all of the major watersheds in Massachusetts during the summers of 1965, 1966, and 1967 and an individual analysis of these fish conducted to determine the concentrations of DDT and metabolites, DDE and DDD (TDE). In all, 1,310 individual fish specimens were collected and analyzed from 93 stations. Mean DDT concentrations based on the analysis of five fish per station ranged from 0.17 to 28.88 parts per million. A study of factors relating to the concentration of pesticide by fish showed that some fish species had varying abilities to concentrate DDT. Results of this study are expressed in parts per million of pesticide found in whole fish and based on dry weight. Conversion factors to convert parts per million based on dry weight to parts per million based on wet weight were determined for nine species of fish. (Author)

PB-217 797
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER AND SEWER BOND SALES IN THE UNITED STATES.

1960, 13p

Descriptors: (*Sewage treatment, *Financing), (*Water treatment, *Financing), Tables (Data).
Identifiers: *Bonds.

The tables supplement the annual publication of contract award data, last reported in Sewage and Water Works Construction 1960. The basic information from which these tables were developed was obtained from the Investment Bankers Association by special arrangement. Data are presented in three categories according to the use of the proceeds from the sale: (1) WATER when the bonds have been sold to finance water facilities; (2) SEWER, to finance sewage facilities; and (3) COMBINATION, to finance jointly water and sewage facilities where the portions attributable to each type are not designated. These data describe only those sales reported to the Investment Bankers Association or assembled by that Association from available documents.

PB-217 798
Environmental Health Center, Cincinnati, Ohio.
EVALUATION STUDY OF DIRECT RECIRCULATION ON A HIGH-RATE TRICKLING FILTER, NEWBERRY, S. C.,
Russell S. Smith, Shinji Soneda, and Robert L. Harris. 1952, 34p

Descriptors: (*Sewage treatment, *Trickling filtration).

A study was made at the Newberry, South Carolina, sewage treatment plant to evaluate the performance of a high-rate trickling filter recirculating the filter effluent to the filter influent and to obtain additional information on the suitability of this method of recirculation for high rate filtration of domestic sewage. Nine 24-hour and an equal number of 4-hour test runs were made during the two-week period covered by the study.

PB-217 799
Federal Water Pollution Control Administration, Washington, D.C.
WATER AND SEWER BOND SALES IN THE UNITED STATES, JANUARY-DECEMBER, 1965.
1965, 14p FWPCA-WP-16

Descriptors: (*Sewage treatment, *Financing), (*Water treatment, *Financing), Tables (Data).
Identifiers: *Bonds.

The report contains data which are basic and necessary to the orderly and efficient management of water supply and pollution control programs. The tables supplement the annual publication of contract award data, last reported in Sewage and Water Works Construction 1965. Data are presented in three categories according to the use of the proceeds from the sale: (1) WATER when the bonds have been sold to finance water facilities; (2) SEWER, to finance sewage facilities; and (3) COMBINATION, to finance jointly water and sewage facilities where the portions attributable to each type are not designated. These data describe only those sales reported to the Investment Bankers Association or assembled by that Association from available documents.

PB-217 800
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER AND SEWER BOND SALES IN THE UNITED STATES.
Rept. for Jan-Dec 63.

1963, 13P PHS-Pub-965-Ed-63

Descriptors: (*Sewage treatment, *Financing), (*Water treatment, *Financing), Inventories, Tables (Data).
Identifiers: *Bonds.

The report of Water and Sewer Bond Sales in the United States contains data which are basic and necessary to the orderly and efficient management of water supply and pollution control programs. The tables supplement the annual publication of contract award data, last reported in Sewage and Water Works Construction 1963. (PHS Publication No. 758.) Similar tables which describe bonds sold between July 1956 and December 1962 are available. The basic information from which these tables were developed was obtained from the Investment Bankers Association by special arrangement. Data are presented in three categories according to the use of the proceeds from the sale: (1) WATER when the bonds have been sold to finance water facilities; (2) SEWER, to finance sewage facilities; and (3) COMBINATION, to finance jointly water and sewage facilities where the portions attributable to each type are not designated. These data describe only those sales reported to the Investment Bankers Association or assembled by that Association from available documents.

PB-217 801
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER AND SEWER BOND SALES IN THE UNITED STATES.
Rept. for Jan-Dec 64.

1964, 14P PHS-Pub-965-Ed-64

Descriptors: (*Sewage treatment, *Financing), (*Water treatment, Financing), Tables (Data).
Identifiers: *Bonds.

The report contains data which are basic and necessary to the orderly and efficient management of water supply and pollution control programs. The tables supplement the annual publication of contract award data, last reported in Sewage and Water Works Construction 1964. (PHS Publication No. 758) The basic information from which these tables were developed was obtained from the Investment Bankers Association by special arrangement. Data are presented in three categories according to the use of the proceeds from the sale: (1) WATER when the bonds have been sold to finance water facilities; (2) SEWER, to finance sewage facilities; and (3) COMBINATION, to finance jointly water and sewage facilities where the portions attributable to each type are not designated. These data describe only those sales reported to the Investment Bankers Association or assembled by that Association from available documents.

PB-217 802
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
A REPORT OF WATER POLLUTION IN THE SOUTH PLATTE RIVER BASIN. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION.
Water pollution series rept.

Feb 53, 60p PHS-Pub-235, PHS-WPS-39
Prepared in cooperation with Colorado Dept. of Public Health, Nebraska Dept. of Public Health and the Wyoming Dept. of Public Health.

Descriptors: (*Platte River Basin, *Water pollution), (*Colorado, Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution).

This report is produced under the cosponsorship of the Colorado Department of Public Health, the Nebraska Department of Health, and the Wyoming Department of Public Health, and the U. S. Public Health Service. It is based on data gathered and reported in the South Platte River Basin Water Pollution Investigation Report of 1950 and subsequent information. The report also presents information concerning use of water resources, pollution entering water resources and resulting damages, benefits which may result from pollution prevention and abatement, pollution prevention measures in effect and those needed. Data and knowledge now available are sufficient to permit the immediate solution of most of the pollution problems within the South Platte River Basin without awaiting the results of additional surveys and studies. A sincere effort has been made to present a fair picture of the water pollution problems in the South Platte River Basin and to present reasonable conclusions and recommendations. (Author Modified Abstract)

PB-217 803
Public Health Service, Washington, D.C.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE MISSISSIPPI--IOWA-CEDAR RIVERS BASIN DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES OF ILLINOIS, IOWA, AND MINNESOTA.
Water pollution series.
1954, 43P PHS-Pub-346, PHS-WPS-61

Descriptors: (*Mississippi River Basin, *Water pollution), (*Cedar River Basin, *Water pollution), (*Iowa River Basin, *Water pollution), (*Iowa, Water pollution), (*Illinois, Water pollution), (*Minnesota, Water pollution).

The report contains the comprehensive water pollution control program for the Mississippi-Iowa-Cedar Rivers Basin of the Iowa State Department of Health, Illinois Sanitary Water Board, and the Minnesota State Department of Health. The program gives full consideration to the several present uses and to the reasonably anticipated future uses of the waters of this basin. It provides an equitable balance in the pollution control requirements for various private and public groups concerned.

PB-217 804
Minnesota State Water Pollution Control Agency, St. Paul.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE RAINY RIVER BASIN.
Water pollution series rept.
1954, 9P PHS-Pub-380, PHS-WPS-68

Descriptors: (*Rainy River basin, *Water pollution), (*Minnesota, Water pollution).

The publication summarizes the Comprehensive Water Pollution Control Program for the Rainy River Basin of the Minnesota State water pollution control agency. The program gives full consideration to the several present uses and to the reasonably anticipated future uses of the waters of the basin. It provides an equitable balance in the pollution control requirements for various private and public groups concerned.

PB-217 805
National Planning Associates, Washington, D. C.
SUMMARY ECONOMIC BASE STUDY CHESAPEAKE BAY DRAINAGE BASINS.
Feb 67, 165p
Contract PH-86-63-92
Includes errata sheet.

Descriptors: (*Chesapeake Bay Basin, *Economic development), New York, Delaware, Pennsylvania, Demography, District of Columbia, Virginia, North Carolina, Forecasting.

The report is designed to provide economic and demographic information useful to water resources planning for the Chesapeake Bay-Susquehanna River Basins. The information includes historical and projected estimates of population, labor force, employment by industry group, income and related measures. The historical years shown in this report are 1950 and 1960; the projections are presented for each decadal year between 1970 and 2020. The areas for which projections are presented include the nation, the six-state area in which the River Basins are located, each of the separate River Basins, subregions within each Basin as defined by economic criteria, regions within each Basin as defined by hydrologic criteria, and countries within each subregion.

PB-217 806
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
TABULATION OF BOTTOM ORGANISMS OBSERVED AT SAMPLING STATIONS DURING THE BIOLOGICAL SURVEY BETWEEN COOPERSTOWN, NEW YORK, AND NORTHUMBERLAND, PENNSYLVANIA. APPENDIX TO BIOLOGICAL SURVEY OF THE SUSQUEHANNA RIVER AND ITS TRIBUTARIES BETWEEN COOPERSTOWN, NEW YORK AND NORTHUMBERLAND, PENNSYLVANIA.
Nov 66, 133p CB-SRBP-Working Document-2

Descriptors: (*Susquehanna River, *Biological surveys), Tables (Data), Aquatic animals, Invertebrates.

The report consists of tables giving a count of various invertebrates found in the river.

PB-217 807
Syracuse Univ., N.Y. Dept. of Chemical Engineering and Metallurgy.
EUTECTIC FREEZING AND HYDRATING FOR WASTE WATER RENOVATION.
Final rept.,

Robert L. Powell, Pei-Chi Chang, Kenneth R. Murphy, Myrton C. Rand, and Allen J. Barduhn.
Jun 64, 81p SURI-Ch.E-1033-6310A1
Contract PH-86-63-38

Descriptors: (*Sewage treatment, *Freezing), (*Hydration, Sewage treatment), Eutectics.
Identifiers: *Tertiary sewage treatment.

Discussed is a new process of concentrating the dissolved inorganic and organic contaminents in the waste stream from a tertiary treatment process by eutectic freezing or hydrating. In this process a substantial fraction of the water (93 to 98%) is first removed by any means such as freezing, hydrating, evaporation, or reverse osmosis. The remaining 2 to 7% of the waste, which presumably contains all or most of the original dissolved material, is subjected to temperatures low enough to precipitate ice and the majority of the organics and inorganic salts simultaneously. The report is a description of the work accomplished during the period June 1962 to February 1964 in checking certain key assumptions made in designing the eutectic process on paper and also in observing the behavior of waste water samples subjected to concentration by freezing.

PB-217 808
Public Health Service, Washington, D.C.
PROCEEDINGS OF THE CONFERENCE IN THE MATTER OF POLLUTION OF THE SOUTH PLATTE RIVER BASIN HELD IN DENVER, COLORADO ON OCTOBER 29, 1963.

1963, 81p
Library of Congress Catalog No. 71-611565.

Descriptors: (*Platte River Basin, *Water pollution), (*Colorado, Water pollution), Proceedings.

The report is a compilation of statements presented by attendees of a conference relative to water pollution sources in the South Platte River Basin in Colorado.

PB-217 809
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
PRESENT TECHNOLOGY OF SLUDGE DEWATERING,
James E. Smith, Jr. Oct 70, 28p

Descriptors: (*Sludge dewatering, *Reviews), (*Sludge disposal, Reviews).
Identifiers: Sludge treatment, *Solid waste disposal.

A review of problems confronted in disposing sludges from water purification and municipal wastewater treatment plants is presented. The quantities and characteristics of these sludges that must be dealt with are enumerated. Each of a variety of biological, chemical and physical treatment alternatives is discussed. This includes the optimization of the aerobic stabilization process, the use of organic polymers and various inorganic additives including iron and aluminum salts, and sludge incinerator ash on sludge filtration and thickening. Pasteurization is also discussed. Land spreading, strip mine reclamation, landfill, ocean disposal, and pipeline transport are discussed. The present economics of some processes are noted. (Autho-)

PB-217 810
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
AIR POLLUTION MEASUREMENTS IN DUQUESNE, PENNSYLVANIA, SEPTEMBER--OCTOBER 1963,
Seymour Hocheiser, Melvin Nolan, and Herbert J. Dunsmore. Oct 64, 33p

Descriptors: (*Pennsylvania, *Air pollution).
Identifiers: *Duquesne (Pennsylvania), *Allegheny County (Pennsylvania), *Air quality data.

Contents: Particulate pollutants (Soiling index, Total suspended particulates); Gaseous pollutants (Sulfur dioxide, total oxidants, carbon monoxide, carbon dioxide, nitric oxide - nitrogen dioxide, total aliphatic aldehydes); High pollution days; Meteorological observations; Representativeness of meteorological conditions during the study (Wind speed, degree-days, precipitation, visibility).

PB-217 812
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE LOWER PORTION UPPER MISSISSIPPI RIVER BASIN DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES OF IOWA, MINNESOTA, AND WISCONSIN.
Water pollution series.

1955, 76P PHS-Pub-450, PHS-WPS-71

Descriptors: (*Mississippi River Basin, *Water pollution), (*Iowa, Water pollution), (*Minnesota, Water pollution), (*Wisconsin, Water pollution).

The report, prepared in cooperation with the water pollution control agencies of Iowa, Minnesota, and Wisconsin, sets forth the water pollution control program being followed by the respective States in the Lower Portion Upper Mississippi River Basin. The program, which is based on data available as of November 1, 1954, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and lakes, and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 813
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE MISSISSIPPI--DES MOINES-SKRUNK RIVERS BASIN DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES OF ILLINOIS, IOWA, MINNESOTA, AND MISSOURI.
Water pollution series.
1953, 55P PHS-Pub-314, PHS-WPS-55

Descriptors: (*Mississippi River Basin, *Water pollution), (*Des Moines River Basin, *Water pollution), (*Skunk River Basin, *Water pollution), (*Illinois, Water pollution), (*Iowa, Water pollution), (*Minnesota, Water pollution), (*Missouri, Water pollution).

The report, prepared in cooperation with the water pollution control agencies of Iowa, Illinois, Minnesota, and Missouri, sets forth the water pollution control program being followed by the respective States in the Mississippi-Des Moines-Skunk Rivers Basin. The program, which is based on data available as of January 1, 1953, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 814
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL FOR THE RED RIVER OF THE NORTH BASIN DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES OF MINNESOTA, NORTH DAKOTA, AND SOUTH DAKOTA ADOPTED BY U. S. DEPT. OF HEALTH, EDUCATION AND WELFARE, BUBLIC HEALTH SERVICE.
Water pollution series rept.
1953, 15P PHS-Pub-293, PHS-WPS-53

Descriptors: (*Red River of the North, *Water pollution), (*Minnesota, Water pollution), (*North Dakota, Water pollution), (*South Dakota, Water pollution).

The publication summarizes the comprehensive water pollution control program for the Red River of the North Basin of the Minnesota State Department of Health, North Dakota State Department of Health, and the South Dakota State Department of Health. The program gives full consideration to the several present uses and to the reasonably-anticipated future uses of the waters of this basin. It provides an equitable balance in the pollution control requirements for the various private and public groups concerned.

PB-217 815
Public Health Service, Cincinnati, Ohio. Div of Water Supply and Pollution Control.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE MERAMEC RIVER BASIN DEVELOPED BY STATE OF MISSOURI DIVISION OF HEALTH AND U.S. PUBLIC HEALTH SERVICE.
Water pollution series.
1957, 14P PHS-Pub-553, PHS-WPS-72

Descriptors: (*Meramec River Basin, *Water pollution), (*Missouri, Water pollution).

The publication summarizes the comprehensive water pollution control program for the Meramec River drainage basin as developed by the Missouri Division of Health and the Public Health Service of the U. S. Department of Health, Education, and Welfare. The program gives full consideration to the several present uses and to the reasonably anticipated future uses of the waters of the basin. It provides an equitable balance in the pollution control requirements for various private and public groups concerned.

PB-217 816
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE LAKE SUPERIOR DRAINAGE BASIN PREPARED IN COOPERATION WITH THE STATE WATER POLLUTION CONTROL AGENCIES OF MICHIGAN, MINNESOTA AND WISCONSIN.
Water pollution series.
1954, 56P PHS-Pub-367, PHS-WPS-66

Descriptors: (*Lake Superior Basin, *Water pollution), (*Michigan, Water pollution), (*Minnesota, Water pollution), (*Wisconsin, Water pollution).

The report, prepared in cooperation with the water pollution control agencies of Michigan, Minnesota, and Wisconsin, sets forth a water pollution control program for the Lake Superior Drainage Basin. The program, which is based on data available as of January 1, 1954, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and lakes, and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 817
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE MISSISSIPPI--SALT RIVERS BASIN DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES OF ILLINOIS, IOWA, AND MISSOURI.
Water pollution series.
1954, 31P PHS-Pub-366, PHS-WPS-65

Descriptors: (*Mississippi River Basin, *Water pollution), (*Salt River Basin, *Water pollution), (*Illinois, Water pollution), (*Iowa, Water pollution), (*Missouri, Water pollution).

The report, prepared in cooperation with the water pollution control agencies of Iowa, Illinois, and Missouri, sets forth the water pollution control program being follwed by the respective States in the Mississippi-Salt Rivers Basin. The program, which is based on data available as of January 1, 1954, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 818
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
A COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM FOR THE MISSISSIPPI--WAPSIPINICON AND TRIBUTARIES RIVERS BASIN DEVELOPED BY THE STATE WATER POLLUTION CONTROL AGENCIES OF ILLINOIS, IOWA, MINNESOTA, AND WISCONSIN.
Water pollution series.
1953, 54P PHS-Pub-347, PHS-WPS-62

Descriptors: (*Mississippi River Basin, *Water pollution), (*Wapsipinicon River Basin, *Water pollution), (*Illinois, Water pollution), (*Iowa, Water pollution), (*Minnesota, Water pollution), (*Wisconsin, Water pollution).

The report, prepared in cooperation with the water pollution control agencies of Iowa, Illinois, Minnesota, and Wisconsin, sets forth the water pollution control program being followed by the respective States in the Mississippi-Wapsipinicon and Tributaries Rivers Basin. The program, which is based on data available as of July 1, 1953, was developed after a thorough consideration of the existing and potential uses of the water resources in the basin; the pollution entering the streams and the resulting damages; the benefits which may result from pollution prevention and abatement; and the prevention measures now in effect as well as those which are needed.

PB-217 819
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
MUNICIPAL WATER FACILITIES COMMUNITIES OF 25,000 POPULATION AND OVER CONTINENTAL UNITED STATES AND TERRITORIAL POSSESSIONS, AS OF JANUARY 1, 1958.
1959, 87p PHS-Pub-661
A cooperative State-Federal Report.

Descriptors: (*Water treatment, *United States), Inventories, Tables (Data).

The inventory, obtained through the cooperation of State Health Departments and local officials, shows the organized community water facilities for approximately 850 municipalities in the United States and territorial possessions of 25,000 population and over. These data reflect changes which have occurred since the last issue, dated December 31, 1956. The purpose of the inventory is to furnish, for the use of industries and other private agencies and all levels of government, up-to-date information on water facilities, particularly for large metropolitan communities.

PB-217 820
Stone (Ralph) and Co., Inc., Los Angeles, Calif.
A STUDY OF SOLID WASTE COLLECTION SYSTEMS COMPARING ONE-MAN WITH MULTI-MAN CREWS.
Final rept.
1969, 200P BSWM-SW-9c, PHS-1892
Contract PH-86-67-248

Descriptors: (*Waste disposal, *Collecting methods), (*Refuse disposal, Collecting methods), (*Manpower, Waste disposal), Requirements.
Identifiers: *Solid waste disposal.

The report summarizes research into the relative functional and cost efficiencies of the one-man crew when compared to alternative two- or three-man crews for the collection of refuse. Four basic analytical techniques were used: comprehensive field surveys; nationwide survey data analysis; time-motion studies; and a mathematical model. The comprehensive field surveys were applied to four municipal collection systems and two private-firm collection systems. The time-motion studies compared field times in three cities with Methods-Time-Measurement values developed under controlled laboratory conditions. A mathematical model was designed to permit simulation of the refuse collection system. The model is a formula which expresses the interrelationships among the variables affecting collection time and system cost. Tables and charts have been prepared to support and illustrate the information developed, and the conclusions and recommendations which have been based thereon. (Author Modified Abstract)

PB-217 821
Bureau of Solid Waste Management, Rockville, Md.
AN ACCOUNTING SYSTEM FOR INCINERATOR OPERATIONS,
Eric R. Zausner. 1970, 20p BSWM-SW-17ts PHS-Pub-2032
Library of Congress card no. 75-606525.
Paper copy available from GPO $0.35 as stock no. HE20.1402:IN2.

Descriptors: (*Incinerators, *Accounting), (*Waste disposal, Incinerators).
Identifiers: *Solid waste disposal.

The proposed system provides a guide to the type and quantity of information to be collected, its classification, and the method of collection. Incinerator supervisors and heads of agencies responsible for their operations will find the system useful.

PB-217 822
Johns Hopkins Univ., Baltimore, Md. Dept. of Environmental Engineering Science.
MANAGEMENT OF RECYCLED WASTE--PROCESS WATER PONDS.
Progress rept. 1 Dec 65-30 Nov 66,
Charles E. Renn. 28 Nov 66, 13p
Grant WPD-117-01-66

Descriptors: (*Industrial waste treatment, *Lagoons (Ponds)).
Identifiers: *Aeration ponds.

Studies of the Black and Decker Manufacturing Company's process water pond at Hampstead, Maryland, during the summer and autumn of 1966 show that it is possible to reduce the nutrient nitrogen levels of stored treated waste waters by alternate thermal stratification and mixing. Studies of the compatibility of process pond water for coolant make up were made. The decomposition of forest leaves carried into the process pond was investigated. The report summarizes the results.

PB-217 823
Johns Hopkins Univ., Baltimore, Md. Dept. of Environmental Engineering Science.
MANAGEMENT OF RECYCLED WASTE--PROCESS WATER PONDS.
Progress rept., 1 Dec 66-30 Nov 67,
Charles E.Renn. 1 Dec 67, 11p
Grant WPD-117-02-67

Descriptors: (*Industrial waste treatment, Lagoons (Ponds)), (*Aquatic microbiology, *Lagoons (Ponds)).
Identifiers: *Aeration ponds.

The study examines the biological, physical and chemical processess that take place in the waste fed process water pond of the Black and Decker Manufacturing Company at Hampstead, Maryland in order to determine general principles that may be applied to water conservation and water quality improvement in water short areas that are otherwise fitted for industrial development.

PB-217 824
Pacific Northwest Water Lab., Corvallis, Oreg.
AERATED LAGOON TREATMENT OF FOOD PROCESSING WASTES.
Progress rept.,
Kenneth A. Dostal. Mar 68, 53p PR-5
Errata sheet inserted.

Descriptors: (*Food processing, *Industrial waste treatment), (*Lagoons (Ponds), Industrial waste treatment).
Identifiers: *Pea processing, *Aeration ponds.

The report presents the data collected from a six-week period of sampling of an aerated lagoon used to treat wastes from the frozen pea processing plant of Kelley-Farquhar located at Ferndale, Washington.

PB-217 825
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
WATER POLLUTION SURVEY, BACK RIVER, 1965.

Feb 67, 71p CB-SRBP-Working Document-6

Descriptors: (*Back River Estuary, *Water pollution), (*Maryland, Water pollution), Sewage, Bacteria, Metals, Chemical composition.
Identifiers: *Water quality data, *Baltimore County (Maryland).

A field survey, designed for the purpose of determining the source, extent, and significance of bacterial pollution of the Back River Estuary, was conducted in November 1965 by the Chesapeake Field Station of the Chesapeake Bay-Susquehanna River Basins Project, in cooperation with State and local public works and health agencies. Significant water quality problems indicated by survey findings are discussed.

PB-217 826
Public Health Service, Washington, D. C. Div. of Water Supply and Pollution Control.
ARKANSAS-RED RIVER BASINS WATER QUALITY CONSERVATION. REPORT ON A BASIC STUDY OF WATER QUALITY, SOURCES OF NATURAL AND MANMADE SALT POLLUTION, AND SUGGESTED CORRECTIVE MEASURES.

Jun 64, 87p
See also report dated 15 Oct 71, PB-203 603-D.

Descriptors: (*Arkansas River Basin, *Water pollution), (*Red River Basin, *Water pollution), Salt water, Minerals, Sources.

Investigations of salt pollution of the Arkansas and Red Rivers were undertaken. The objectives of the project were: To locate and define the significant natural and manmade sources of salt (mineral) pollution; to determine the effects of these sources on the quality of water in the receiving streams; To propose possible methods and procedures for reduction of these highly mineralized discharges; To estimate the results of reduction of these discharges on stream quality; and to determine the benefits of water quality improvements to present and future municipal, industrial, agricultural water users.

PB-217 827
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.

KANSAS RIVER BASIN WATER POLLUTION INVESTIGATION.
Jun 49, 359p
Prepared in cooperation with Environmental Health Center, Cincinnati, Ohio.

Descriptors: (*Kansas River Basin, *Water pollution), (*Colorado, Water pollution), (*Kansas, Water pollution), (*Nebraska, Water pollution).
Identifiers: *Water quality data.

In accordance with the text of the Memorandum of Understanding, The stream pollution investigations on the Kansas River Basin includes, (a) The extent, types, and major sources of pollution; (b) A review of existing State laws in Nebraska, Kansas and Colorado, and pending legislation regarding pollution of public waters; (c) Minimum stream flows necessary below the reservoirs for public water supplies and for sanitation purposes with present and contemplated pollution; (d) Public water supply needs; (e) Possible benefits to abatement of water pollution problems by reservoir releases and the return of irrigation water; and (f) Recommendations and existing plans for pollution abatement.

PB-217 828
Public Health Service, Kansas City, Mo. Revion VI.
STATEMENT: WATER QUALITY MANAGEMENT AND POLLUTION CONTROL PROGRAM IN IOWA, KANSAS, MISSOURI, AND NEBRASKA. VOLUME II. APPENDIX A MISSOURI WATER RESOURCES APPENDIX B - WATER QUALITY AND BASIC DATA.

May 64, 370p
Presented before the Natural Resources and Power Subcommittee of the House Committee on Government Operations, Kansis City, Missouri on 22-23 May 1964.

Descriptors: (*Kansas, *Water resources), (*Iowa, *Water resources), (*Missouri, *Water resources), (*Nebraska, Water resources), (*Reservoirs, Water resources), Forecasting.

The purpose of the study was to determine the need for and value of storage for municipal and industrial water supply and water quality control. The studies cover water storage needs and values during the study periods, usually 50 or 100 years. The present and future needs for water storage for streamflow regulation for quality control are estimated. The present needs are based on uncontrolled streamflows, organic and inorganic concentrations and other miscellaneous factors. Economic projections, water quality, and prospective legitimate water uses are used in estimating future needs for streamflow regulation for quality control. The preceding statements are from water resource reports of studies made in the Four-State area of Iowa, Kansas, Missouri and Nebraska.

PB-217 829
Federal Water Pollution Control Administration, Washington, D.C.
PROCEEDINGS OF SECOND SESSION OF THE CONFERENCE TO CONSIDER THE ESTABLISHMENT OF WATER QUALITY STANDARDS FOR THE MISSOURI RIVER BASIN INTERSTATE WATERS. STATE OF IOWA. HELD IN COUNCIL BLUFFS, IOWA, ON 15-16 APRIL 1969.
1969, 766p
Library of Congress Catalog Card No. 73-605033.

Descriptors: (*Mississippi River Basin, *Water pollution), (*Iowa, Water pollution), Standards, Proceedings.
Identifiers: *Water pollution standards.

The conference considers the establishment of water quality standards for the waters of the Mississippi River, Missouri River, and designated tributaries of these waters subject to the jurisdiction of Iowa which are considered interstate waters under the Federal act. (Author Modified Abstract)

PB-217 830
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
SOUTH PLATTE RIVER BASIN WATER POLLUTION INVESTIGATION. EXHIBITS AND APPENDICES.
Water pollution series.

Jul 50, 193p
Library of Congress Catalog card no. 75-613591. See also PB-217 674.

Descriptors: (*Platte River Basin, *Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution), (*Colorado, Water pollution).

These exhibits and appendices to the main report include: Stream designations; Stream pollution survey of the portions of the South Platte River and Cherry Creek which lie within the City and County of Denver; Sample reports on typical wastes investigations; State water pollution control legislation; Beet sugar wastes investigations; Bacteriological study of irrigated fruits and vegetables; Project effects on low-flow conditions in the South Platte River Basin.

PB-217 832
Federal Water Quality Administration, Washington, D.C.
CLEAN WATER FOR THE 1970'S: A STATUS REPORT.
Jun 70, 93p

Descriptors: (*Water pollution, *United States), Reviews.

Water pollution control is one of the major aspects of environmental protection and enhancement. This first annual progress report provides a ground work for understanding the nature of the Federal and State water pollution control programs, details the progress which has been made during the first year of the Nixon Administration, and assesses the measures which will be required to fulfill the challenge of the 1970's.

PB-217 833
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
BIOLOGICAL SURVEY OF ROCK CREEK FROM ROCKVILLE, MARYLAND TO THE POTOMAC RIVER.
Oct 66, 17p CB-SRBP-Working Document-4

Descriptors: (*Rock Creek, *Biological surveys), (*District of Columbia, Water pollution), (*Water pollution, Rock Creek), Indicator species, Benthos, Potomac River Basin.

A biological survey of Rock Creek, a tributary of the Potomac River, was conducted in August 1966. The survey was made to determine the biological condition of the stream from north of Rockville, Maryland, to the mouth of the stream in Washington, D.C.

PB-217 834
Ionics, Inc., Cambridge, Mass.
CONVERSION OF ORGANIC SOLID WASTES INTO YEAST. AN ECONOMIC EVALUATION,
Floyd H. Meller. 1969, 184p PHS-Pub-1909
Contract PH-86-67-204

Descriptors: (*Waste disposal, *Fermentation), (*Yeasts, Production), Hydrolysis, Utilization, Cost estimates.
Identifiers: *Solid waste disposal.

Contents: Economic considerations of solid waste raw materials; The hydrolysis process; The fermentation process; Market analysis for yeast.

PB-217 835
District of Columbia Dept. of Sanitary Engineering, Washington.
KENILWORTH MODEL SANITARY LANDFILL. INTERIM REPORT ON A SOLID WASTE DEMONSTRATION PROJECT, DECEMBER, 1967-JANUARY, 1969.

1969, 117p
Grant UI-00143

Descriptors: (*Waste disposal, *Earth fills), (*District of Columbia, Waste disposal), Construction, Grading (Earthworking), Design, Specifications, Safety, Operations, Requirements.
Identifiers: *Sanitary landfills, *Kenilworth sanitary landfill, Demonstration projects.

Objectives were to demonstrate how open dumping and burning of trash can be eliminated, and the site of the burning and other small tracts of land, within densely populated metropolitan areas, can be recliamed for recreational use utilizing model sanitary landfill methods. (Author)

PB-217 836
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
AN EXPERIMENT TO DETERMINE THE RELATION BETWEEN DISSOLVED OXYGEN CHANGE IN PIPELINE FLOW AND REYNOLDS NUMBER.
National water quality network applications and development rept. no. 8,
Harry Stierli, John D. Weeks, and Ross A. Buck.
Dec 63, 23p

Descriptors: (*Dissolved gases, *Water pipelines), Oxygen.

Under certain flow conditions, there can be a significant change in the amount of dissolved oxygen as water travels from a pump intake through piping to a discharge point in a field station. The experiment obtains data that will help to establish operating conditions for satisfactory water sampling. For practical reasons, the experiment was divided into two parts. The first was to measure temperature, dissolved oxygen concentration, and conductivity of the Little Miami River in cross-section. The second part was to measure dissolved oxygen changes in intake and discharge samples with different pipeline flow conditions The primary objective was to determine a Reynolds number that would permit satisfactory operation.

PB-217 837
Public Health Service, Cincinnati, Ohio. Div. of Water Supply and Pollution Control.
NATIONAL WATER QUALITY NETWORK APPLICATIONS AND DEVELOPMENT REPORT. 6. EVALUATION OF THE FIELD PERFORMANCE OF A HAYS DISSOLVED OXYGEN ANALYZER,
John D. Weeks. Oct 62, 40p

Descriptors: (*Water analysis, *Dissolved gases), Water pollution, Oxygen, Partial pressure.
Identifiers: *Water pollution detection.

The Hays Dissolved Oxygen Analyzer was operated at the Little Miami River Field Test Station of the National Water Quality Network from July 17, 1962, to September 27, 1962. This evaluation was undertaken in order to determine if the instrument is suitable for utilization in the National Water Quality Network's field activities.

PB-217 838
Environmental Control Administration, Rockville, Md.
CONTROL OF DOMESTIC RATS AND MICE. TRAINING GUIDE. RODENT CONTROL SERIES,
Bayard F. Bjornson, Harry D. Pratt, and Kent S. Littig. 1970, 48p PHS-Pub-563

Descriptors: (*Disease vectors, Rodents), (*Pest control, *Rodents), Infectious diseases, Bites and Stings, Public health, Manuals, Education, Rodenticides.

Contents: Rodents and human welfare; Description and habits of domestic rats and mice; Recognizing rat and mouse signs; Control of rodent populations; Sanitation for rat and mouse control; Rodent killing; Ratproffing; Organization of community rat-control programs.

PB-217 840
California State Dept. of Water Resources, Fresno. San Joaquin District.
REMOVAL OF NITROGEN FROM TILE DRAINAGE.
Summary rept.,
Randall L. Brown. May 71, 40p DWR-174-9 EPA-WQO-13030-ELY-5/71-6, REC-R2-71-6
Contract DI-14-06-200-3389A
Report on Bio-Engineering Aspects of Agricultural Drainage, San Joaquin Valley, California.
Paper copy available from GPO $0.50 as EP1.16:13030-ELY-5/71-6.

Descriptors: (*Tile drains, Water treatment), (*Nitrogen, *Chemical removal (Water treatment)), Algae, Harvesting, Irrigation, Desalting, Subsurface drainage.
Identifiers: *Water pollution control, *Denitrification.

Studies by an interagency group have shown that it is technically feasible to reduce 20 mg/l nitrate-nitrogen in agricultural tile drainage to 2-5 mg/l by either algae stripping or bacterial denitrification. Conditions necessary for maximum algal growth included 8- to 12-inch pond depth, addition of small amounts of nutrients (CO_2, Fe, and P), up to four hours of daily mixing and detention times of from 5 to 16 days, depending on the season. Bacterial denitrification was tested in anaerobic deep ponds and filters using methanol as a carbon source. Required detention times were on the order of 8 to 30 days for covered ponds and 1 to 2 hours for filters. During long-term operation of the filters periodic flushing was required to remove accumulated bacterial biomass. Two desalination processes were also studied -- electrodialysis and reverse osmosis. (Author Modified Abstract)

PB-217 841
Department of Health, Education and Welfare, Washington, D.C.
CONFERENCE IN THE MATTER OF POLLUTION OF THE INTER-STATE WATERS OF THE MISSOURI RIVER-OMAHA, NEBRASKA--IOWA-MISSOURI-KANSAS).

1964, 371p
Proceedings of the First Session, 14 Jun 57, Proceedings of the Second Session 21 Jul 64. Library of Congress Catalog Card No. 75-611637.

Descriptors: (*Missouri River, *Water pollution), (*Omaha, Water pollution), (*Nebraska, Water pollution), (*Missouri, Water pollution), (*Kansas, Water pollution), Proceedings.
Identifiers: *Omaha (Nebraska).

The report consists of the proceedings of a conference held on June 14, 1957 in Omaha, Nebraska, on the matter of pollution of the interstate waters of the Missouri River--Omaha, Nebraska area (Nebraska, Iowa, Missouri and Kansas).

PB-217 842
Bureau of Solid Waste Management, Rockville, Md.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL (IRGRD). INFORMATION BULLETIN. NUMBERS 1-12 NOVEMBER 1956 TO SEPTEMBER 1961,
John S. Wiley. 1969, 302p
Trans. from International Research Group on Refuse Disposal. Information Bulletin (Switzerland) n1-12 Nov 56-Sep 61, by Warren L. Armstrong.

Descriptors: (*Waste disposal, *Periodicals), (*Europe, Waste disposal), (*Composts, Waste disposal), Translations.
Identifiers: *Solid waste disposal.

The report is a compilation of papers concerned with the recycling and disposal of sewage and solid wastes. Composting is the major topic.

PB-217 844
Federal Water Pollution Control Administration, Metuchen, N.J. Raritan Bay Project.
SUMMARY REPORT FOR THE CONFERENCE ON POLLUTION OF RARITAN BAY AND ADJACENT INTERSTATE WATERS. THIRD SESSION.

May 67, 25p
See also PB-218 089 and PB-218 090.

Descriptors: (*Raritan Bay, *Water pollution), (*New York, Water pollution), (*New Jersey, Water pollution), Proceedings, Sewage.
Identifiers: Sewage treatment effluent.

The primary cause of pollution of the eastern section of Raritan Bay is the transfer of untreated and inadequately treated wastes from Upper Bay through the Narrows. The major cause of pollution of the western section is the direct discharge of raw and inadequately treated municipal wastes. Additional pollution in the western section results from the interchange of these waters with the polluted Raritan River and Arthur Kill. Plans or construction are underway for improved wastes treatment facilities for a number of sources in the area. These problems are discussed.

PB-217 845
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
WILLAPA RIVER BASIN (WASHINGTON) ECONOMIC BASE STUDY AND ESTIMATE OF GROWTH, 1960-2010.

29 Mar 63, 22p Working Paper-43
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willapa River Basin, *Economic development), (*Washington (State), Economic development), Forecasting, River basin development.
Identifiers: *Pacific County (Washington).

The analysis is intended to provide an estimate of the economic potentials and anticipated growth of the subject area as guidance in examining water supply and water quality needs.

PB-217 846
Federal Water Pollution Control Administration, Denver, Colo. Region VIII.
WATER QUALITY CONTROL STUDY SUN--TETON UNIT MONTANA. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER FOR THE PURPOSE OF WATER QUALITY CONTROL OF THE SUN-TETON UNIT, MONTANA.

Jul 66, 45p

Descriptors: (*Sun River Basin, *Reservoirs), (*Montana, *Water resources), (*Teton River Basin, *Reservoirs), Forecasting.

The general objectives of this study are (1) to assess the effects of reservoir construction and operation on water quality in the Sun and Teton Rivers and in the proposed project reservoirs, (2) to ascertain what benefits are achieved or lost from changes in water quality, (3) to assess the suitability of the water for proposed water uses, and (4) to determine the need for and value of streamflow regulation for the purpose of water quality control. The necessity of streamflow regulation was studied not only in light of present conditions but also for anticipated future conditions in the study area to the year 2075. The study area includes the Sun River Basin in Lewis and Clark, Teton, and Cascade Counties and the Teton River Basin in Teton and Choteau Counties. (Author)

PB-217 847
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY CONTROL AND MANAGEMENT. WILLAMETTE RIVER BASIN.
Jan 67, 16p

Descriptors: (*Willamette River Basin, *Water pollution), (*Oregon, Water pollution).

The report is focused on the presentation of the principal findings of the study as they relate to requirements for action to control pollution. It emphasizes that pollution does exist in the Willamette River system, that pulp and paper mills that have been subject to less stringent waste control requirements than municipalities and other sources of waste are the major causes of pollution, that pollution abatement will require immediate improvements in the level of waste reduction achieved in the Willamette River system, and that the continuing control of pollution will impose demands for action well into the future upon the people and industries of the Willamette River Basin, as well as upon the State and Federal agencies that serve them.

PB-217 848
Pacific Northwest Water Lab., Corvallis, Oreg.
FLATHEAD LAKE BACTERIOLOGICAL STUDY,
Ralph R. Bauer. Apr 69, 60p

Descriptors: (*Flathead Lake, *Water pollution), (*Montana, Water pollution), Coliform bacteria.
Identifiers: Water quality data.

The purpose of this survey was to determine the concentration and distribution of coliform bacteria present in Flathead Lake, Montana, during a heavy use period as compared with the applicable state water quality standards. The term 'coliform' means total coliform except when otherwise stated.

PB-217 849
Federal Water Pollution Control Administration, Athens, Ga. Southeast Water Lab.
ROLE OF SOILS AND SEDIMENT IN WATER POLLUTION CONTROL. PART 1. REACTIONS OF NITROGENOUS AND PHOSPHATIC COMPOUNDS WITH SOILS AND GEOLOGIC STRATA,
George W. Bailey. Mar 68, 96p

Descriptors: (*Industrial waste treatment, Irrigation), (*Sewage treatment, *Irrigation), (*Soil properties, *Sewage disposal).
Identifiers: *Liquid waste disposal, *Sewage irrigation.

Literature on the reaction, nature, fate, and behavior of nitrogenous and phosphatic compounds in soils and geologic strata have been reviewed in relation to the use of soil and geologic strata as a media for municipal and industrial disposal. The report consists of four sections which includes: Nature and properties of soils; chemical character of sewage; behavior of nitrogen in soils; and behavior of phosphorus in soils. (Author Modified Abstract)

PB-217 850
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.

WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME 6. UPPER MISSISSIPPI RIVER BASIN.
Annual compilation of data 1 Oct 62-30 Sep 63.

30 Sep 63, 121p PHS-Pub-663-Ed-1963-Vol-6

Descriptors: (*Mississippi River Basin, *Water pollution), Tables (Data), Illinois River, Rainy River, Red River of the North.
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the Upper Mississippi River Basin. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 851
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME 10. PACIFIC NORTHWEST BASIN; ALASKA BASIN.
Annual compilation of data 1 Oct 62-30 Sep 63.

30 Sep 63, 188p PHS-Pub-663-Ed-1963-Vol-10

Descriptors: (*Pacific Northwest Basin, *Water pollution), (*Alaska Basin, *Water pollution), Tables (Data), Clearwater River, Columbia River, Pend Oreille River, Snake River, Spokane River, Willamette River, Yakima River, Chena River, Ship River.
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the Pacific Northwest and Alaska Basins. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand, temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 852
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. VOLUME II. CALIFORNIA BASIN; GREAT BASIN.
Annual compilation of data 1 Oct 62-30 Sep 63.

30 Sep 63, 74p PHS-Pub-663-Ed-1963-Vol-11

Descriptors: (*California Basin, *Water pollution), (*Great Basin, *Water pollution), Tables (Data), Klamath River, Sacramento River, San Joaquin River, Bear River, Truckee River.
Identifiers: *Water quality data.

The report presents water quality data for major river basins in the California Basin and the Great Basin. The data was compiled from October 1, 1962 thru September 30, 1963 and covers radioactivity, plankton, organic chemicals, ammonia, chlorine demand, color, oxygen demand, temperature, minerals, turbidity, trace elements, coliform bacteria, and stream flow.

PB-217 853
East Central State Coll., Ada, Okla. School of Environmental Science.
SOIL SYSTEMS FOR MUNICIPAL EFFLUENTS. A WORKSHOP AND SELECTED REFERENCES.
Clean water rept.,
Ralph H. Ramsey, C. Rhys Wetherill, and H. Casper Duffer. Feb 72, 60p EPA-16080-GWF-02/72
Paper copy available from GPO *0.65, as stock no. EPI.16:16080GWF.

Descriptors: (*Sewage disposal, *Irrigation), (*Bibliographies, Sewage disposal), Percolation.
Identifiers: *Liquid waste disposal, *Sewage irrigation, *Waste water reuse.

An investigation of the use of Soil Systems for recycling treated municipal waste effluents was conducted. The scope of the project included: the preparation of a user manual entitled Applying Treated Municipal Wastewater to the Land: Current Technology and an annotated bibliography of selected references in subject area. A state of the art investigation was made of the design, operation and control of irrigation and infiltration-percolation types of soil systems. The summarized results from this investigation were used by workshop participants selected from state, municipal, and federal agencies who were involved in soil system activities as a starting point in writing the manual. The bibliography contains selections which protrayed or influenced the present state of art in the subject field. (Author Modified Abstract)

PB-217 854
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
NATIONAL WATER QUALITY NETWORK APPLICATIONS AND DEVELOPMENT REPORT NO. 7. A PRELIMINARY REPORT ON THE EFFECT OF PUMP AND PIPE SYSTEMS ON DISSOLVED OXYGEN CONCENTRATION,
John D. Weeks. Jan 63, 21p

Descriptors: (*Pipeline transportation, *Dissolved gases), Oxygen, Aeration.

The report presents data which indicate that pipe and pump systems can alter the dissolved oxygen concentration, percent saturation and temperature of a water sample as it is pumped from a river to a distant sampling site. These data were obtained at the Little Miami River Field Test Station during the period July 27 to September 21, 1962. A jet and a submersible pump were delivering water through 400 feet of plastic pipe against a lift of 44 feet. (Author Modified Abstract)

PB-217 855
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER AND SEWER BOND SALES IN THE UNITED STATES.
Rept. for Jan-Dec 62.
1962, 13P PHS-Pub-965-Ed-62

Descriptors: (*Sewage treatment, *Financing), (*Water treatment, *Financing), Inventories, Tables (Data).
Identifiers: *Bonds.

The report contains data which are basic and necessary to the orderly and efficient management of water supply and pollution control programs. The tables supplement the annual publication of contract award data, last reported in Sewage and Water Works Construction 1962. (PHS Publication No. 758). Similar tables which describe bonds sold between July 1956 and December 1961 are available. The basic information from which these tables were developed was obtained from the Investment Bankers Association by special arrangement. Data are presented in three categories according to the use of the proceeds from the sale: (1) WATER when the bonds have been sold to finance water facilities; (2) SEWER, to finance sewage facilities; and (3) COMBINATION, to finance jointly water and sewage facilities where the portions attributable to each type are not designated. Data describing bonds sold to finance other types of construction in combination with water and/or sewage facilities construction are excluded. These data describe only those sales reported to the Investment Bankers Association or assembled by that Association from available documents.

PB-217 856
Public Health Service, Denver, Colo. Region VIII.
SIGNIFICANT VECTOR PROBLEMS IN THE SOUTH PLATTE RIVER BASIN.

Mar 65, 36p PR-2

Descriptors: (*Water pollution, Platte River Basin), (*Disease vectors, *Platte River Basin), Colorado, Sources, Water quality, Abatement, Public health, Projects, Insects, Ecology, Breeding, Culicidae, Rats, Dipters, Infectious diseases.

Significant vector populations of mosquitoes, rats, and flies exist in the Basin and constitute a serious public health hazard. These vectors, especially mosquitoes and rats, are directly associated with the organic pollution present in the waters of the Basin. This pollution is instrumental in creating and supporting the present high population levels of disease-carrying vectors, particularly in the Denver Metropolitan area. Future vector population levels will remain high as long as significant quantities of organic pollutants are discharged to the waters of the Basin. Reduction or elimination of present vector populations will best be accomplished through the abatement or elimination of the gross organic pollution now being discharged to receiving waters throughout the Basin.

PB-217 857
Public Health Service, Denver, Colo. Region VIII.
WATER RESOURCES STUDY AND PUBLIC HEALTH ASPECTS OF THE WHEATLAND UNIT - LARAMIE DIVISION, WYOMING: STUDY OF EFFECT OF PROJECT DEVELOPMENT WATER QUALITY, NEEDS AND VALUE OF WATER FOR THE PURPOSE OF WATER QUALITY CONTROL, AND THE PUBLIC HEALTH ASPECTS OF THE WHEATLAND UNIT, LARAMIE DIVISION - WYOMING, BUREAU OF RECLAMATION, REGION 7.
Dec 73, 59p

Descriptors: (*Laramie River Basin, *Reservoirs), (*Wyoming, *Water resources), Forecasting.
Identifiers: Platte County (Wyoming), Albany County (Wyoming), Carbon County (Wyoming).

General objectives of the study are to assess the probable effects of project construction and operation on water quality in local streams, reservoirs, and wells; to ascertain the benefits or harm resulting from changes in water quality; and to determine the need for and the value of storage for regulation of streamflow for the purpose of water quality control. These objectives were studied in the light of present conditions; also under anticipated economic development of the years 1985, 2010, and 2060. The report also includes the results of a study of general public health aspects and insect vector control of the project. A preliminary evaluation of the insect vector problems that may be associated with development of the Wheatland Unit is presented.

PB-217 858
Public Health Service, Denver, Colo. Region VIII.
WATER QUALITY CONTROL STUDY AND PUBLIC HEALTH ASPECTS OF THE WEST DIVIDE PROJECT COLORADO: STUDY OF POTENTIAL NEEDS AND VALUE OF WATER FOR THE PURPOSE OF WATER QUALITY CONTROL AND THE PUBLIC HEALTH ASPECTS OF THE WEST DIVIDE PROJECT, COLORADO.

Oct 64, 44p

Descriptors: (*Colorado River Basin, *Reservoirs), (*Colorado, *Water resources), Forecasting.

General objectives of the water quality control study are to assess the probable effects the proposed project will have on water quality in local streams and reservoirs; to ascertain the benefits or harm resulting from changes in water quality; to assess the suitability of the water for

proposed water uses; and to examine the need for regulation of streamflow for the purpose of water quality control. The need for streamflow regulation was studied not only for the present conditions, but also for anticipated future conditions in the WEST Divide Project area for the years 1970, 1985, 2010, and 2060. The report includes the results of a study of general public health aspects and insect vector control of the project. A preliminary evaluation of the insect vector problems that may be associated with the project is presented.

PB-217 880
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
POLLUTION-CAUSED FISH KILLS IN 1960.
1960, 21p PHS-Pub-847

Descriptors: (*Water pollution, *Fresh water fishes), Tables (Data).
Identifiers: *Fishkill, *Water pollution effects (Animals).

The acitivity covered in this report, the first of a series to be prepared annually, has been initiated by the Public Health Service in response to the need for additional information on the effect of pollution in the Nation's waters.

PB-217 891
Public Health Service, Portland, Oreg. Div of Water Supply and Pollution Control.
WILLOW CREEK AREA (OREGON) PRELIMINARY ECONOMIC REPORT AND ESTIMATE OF GROWTH, 1960-2010.

Mar 62, 10p Working Paper-6
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willow Creek, *Economic development), (*Oregon, Economic development), River basin development, Forecasting.
Identifiers: *Morrow County (Oregon).

The analysis is intended to provide a preliminary estimate of the economic potentials and economic growth of the subject area.

PB-217 892
Public Health Service, Metuchen, N.J. Raritan Bay Project.
PROGRESS REPORT FOR THE CONFERENCE ON POLLUTION OF RARITAN BAY AND ADJACENT INTERSTATE WATERS. SECOND SESSION.

Apr 63, 78p
See also PB-217 844, PB-218 089, and PB-218 090.

Descriptors: (*Raritan Bay, *Water pollution), (*New York, Water pollution), (*New Jersey, Water pollution), Proceedings.
Identifiers: *Water quality data.

A conference concerning the pollution of interstate waters of Raritan Bay was attended by representatives of the New Jersey and New York state departments of health, the Interstate Sanitation Commission of New York, New Jersey, Connecticut, and the U.S. Department of Health, Education and Welfare. The report summarizes the progress made in area investigation.

PB-217 893
National Air Pollution Administration, Raleigh, N.C.
AIR POLLUTION CONTROL ACTIVE RESEARCH GRANTS FOR FISCAL YEAR 1969.

Oct 69, 45p APTD-69-21

Descriptors: (*Air pollution, Research), Inventories.

Contents: Air pollution effects on human health, welfare, or productivity; Agricultural effects of air pollution; Economic and Pollitical studies; Analysis and physico-chemical investigations; Description and control of air pollution sources; Communication.

PB-217 894
Illinois Univ., Urbana.
GLENWOOD SEWAGE TREATMENT PLANT.
Annual rept.
1967, 5P
Grant WPD-33
See also PB-217 903 and PB-217 899.

Descriptors: (*Sewage treatment, Minnesota), Flow rate, Infiltration.
Identifiers: *Glenwood (Minnesota).

In the previous annaul report, the authors described the plant at Glenwood, Minnesota and its mode of operation. In this report, they discuss their high flow problem and how they corrected it by finding infiltration sources.

PB-217 895
Kansas Univ., Lawrence. Center for Research in Engineering Science.
DEVELOPMENT AND EVALUATION OF A MATHEMATICAL MODEL OF THE LOWER REACHES OF THE KANSAS RIVER DRAINAGE SYSTEM,
Robert L. Smith, Walter J. O'Brien, Albert R. Lefeuvre, and Ernest C. Pogge. Jan 67, 147p
Contract PH-86-66-63

Descriptors: (*Kansas River Basin, *Mathematical models), (*Hydology, Kansas River Basin), Computer programs.

A mathematical model suitable for simulating the distribution of the conservative and the non-conservative water quality of the river system in the lower Kansas River basin is described. The model consists of three digital computer programs and considers both quasi-steady-state and dynamic hydrologic boundary conditions. The hydrologic and conservative portion of the model has been tested for verification with discharge records for six time periods of from four to six weeks in length. Satisfactory verification was obtained. Additional refinement of the model could be achieved by increasing the scope of the data input but this does not appear to be justified at the present time. (Author)

PB-217 897
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
APPRAISAL OF AIR POLLUTION IN TENNESSEE. REPORT OF A COOPERATIVE SURVEY BY THE U.S. PUBLIC HEALTH SERVICE, AND THE STATE OF TENNESSEE DEPARTMENT OF PUBLIC HEALTH, DECEMBER 1956-JULY 1957,
Paul A. Kenline. Sep 67, 92p

Descriptors: (*Tennessee, *Air pollution).

An appraisal of factors relative to air pollution was made in Tennessee by the Public Health Service at the request of, and in cooperation with, the State of Tennessee Department of Public Health, for purposes of determining the status of air pollution in the State and the need for activity by the State government in solving air pollution problems. These purposes were accomplished through interpretation of information obtained by review of existing published and unpublished material, by interviewing local health officers, city officials, and others; by personal observation; and by questionnaires.

PB-217 898
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY CONTROL STUDY. MIDDLE SNAKE RIVER WATER RESOURCES DEVELOPMENT.
Jan 68, 98p

Descriptors: (*Snake River Basin, *Water pollution), (*Oregon, *Water pollution), (*Idaho, *Water pollution), (*Reservoirs, Snake River Basin).
Identifiers: *Water quality data.

The investigation explored all aspects of water quality associated with a reservoir development on Middle Snake, and advised the Bureau of Reclamation on those aspects needing consideration in formulating development plans. The report focused primarily on needs for downstream water quality control, principally temperature, for fishery enhancement purposes. In addition, project effects on water quality, both downstream and in the reservoirs, under alternative development and operation schemes, have been analyzed, and an appraisal of the need for water quality management facilities in the project structures has been made. The influence of altered quality on present and future uses and the net change to be expected in these uses have been determined, considering both beneficial and detrimental. Available data on water uses, waste sources, and water quality in the study area were examined, evaluated, and projected to provide a base for this water quality analysis.

PB-217 899
Illinois Univ., Urbana.
WASTE TREATMENT PLANT, GLENWOOD, MINNESOTA.
Progress rept., 1 Nov 67-30 Apr 68,
H. Orin Halverson. 13 Apr 68, 10p
Grant WPD-33
See also PB-217 894 and PB-216 227.

Descriptors: (*Sewage treatment, Minnesota), Infiltration, Sludge.
Identifiers: *Glensood (Minnesota).

The report briefly summarizes data from November 1, 1967 to April 30, 1968. The plant is still handicapped by a heavy infiltration that increases the flow beyond the capacity of the final settling tank. This is discussed and data is given for monthly sludge averages.

PB-217 900
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
STUDY PLAN FOR A COMPREHENSIVE WATER POLLUTION CONTROL PROJECT, MISSOURI-SOURIS-RED RIVER BASINS.

Jan 66, 82p

Descriptors: (*Missouri River Basin, *Water pollution), (*Souris River Basin, *Water pollution), (*Red River Basin, *Water pollution), Project planning.

The study plan represents background material required for a program review of the Missouri-Souris-Red River Basins Project. It contains information relative to budget, personnel, administrative and operational procedures likely to be encountered during the duration of this project. Each individual activity described in this plan is an integral part of the entire project and is necessary to the Program. (Author Modified Abstract)

PB-217 901
Federal Water Pollution Control Administration, Boston, Mass. Merrimack River Project.
REPORT ON POLLUTION -- NAVIGABLE WATERS OF THE PENOBSCOT RIVER AND UPPER PENOBSCOT BAY IN MAINE.
Feb 67, 147p

Descriptors: (*Penobscot River, *Water pollution), (*Penobscot Bay, *Water pollution),

(*Maine, Water pollution), Clams, Shellfish, Food contamination, Fishing grounds, Economic analysis.

The Commissioner of Sea and Shore Fisheries for the State of Maine, Mr. Ronald W. Green, ordered the closing of the remaining shellfish beds in Searsport and Stockton Springs, Maine, on June 28, 1966, because of the polluted condition of the water. The Federal Water Pollution Control Administation, in conjunction with the United States Public Health Service, conducted an investigation of the Penobscot River below Bangor, Maine, and the upper Penobscot Bay area to determine the sources of this pollution, the direction of travel of this pollution, and the degree of economic injury involved.

PB-217 902
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
METAL PLATING WASTES IN MUNICIPAL SEWERAGE SYSTEMS,
F. W. Kittrell. 1956, 23p
Presented at the Southern Municipal and Industrial Waste Conference (5th), Chapel Hill, N.C., 6 Apr 56.

Descriptors: (*Metal finishing, *Industrial wastes), (*Sewage treatment, Industrial wastes), Cyanides.
Identifiers: *Water pollution control.

The report discusses plating waste complexities, effects on and limits for admission to sewerage systems, and consideration of plating wastes in sewage plant design.

PB-217 903
Illinois Univ., Urbana.
WASTE TREATMENT PLANT, GLENWOOD, MINNESOTA.
Progress rept., Apr-Nov 67.

1967, 7P
See also PB-217 904 and PB-217 894.

Descriptors: (*Sewage treatment, Minnesota).
Identifiers: *Glenwood (Minnesota).

In the accompanying tables are given a monthly average of flow and various analytical data such as COD, BOD, suspended solids in the channel, volume of settable solids in the channel, suspended solids in the effluent, nitrate in the effluent, total nitrogen, etc.

PB-217 904
Illinois Univ., Urbana.
SEWAGE DEMONSTRATION PLANT AT GLENWOOD, MINNESOTA.
Annual progress rept.

1965, 20P
Grant WPD-33
See also PB-217 903.

Descriptors: (*Sewage treatment, Minnesota), Channels (Waterways), Performance evaluation.
Identifiers: *Glenwood (Minnesota).

The purpose of the demonstration plant at Glenwood was to determine whether or not the Oxidation Channel type of sewage treatment as developed in Holland will remove more of the plant nutrients from the effluent than is possible with the more conventional types of sewage treatment. One of the principle investigators visited a number of these plants in Europe and came to the conclusion that these plants had the unique feature of assimilating much of the nitrogen and phosphate into microbial protoplasm that could be removed from the system before these ingredients were again released into solution through a breakdown or decomposition of the microorganisms involved.

PB-217 905
Federal Water Pollution Control Administration, Needham Heights, Mass. New England Basins Office.
MANPOWER NEEDS AT WATER POLLUTION CONTROL FACILITIES IN NEW ENGLAND,
Paul Ferraro. Jun 69, 58p CWT-10-10

Descriptors: (*New England, Sewage treatment), (*Sewage treatment, *Manpower), Requirements.

Contents: General background; Manpower; (Present resource, Future Needs); Salaries (New England Survey findings, National survey findings, Comparable occupations, Salary comparison with comparable occupations, Upgrading salaries); Training; (Existing training programs and opportunities, Future training needs and opportunities); Certification; Recruitment.

PB-217 906
Federal Water Pollution Control Administration, Denver, Colo. South Platte River Basin Project.
CONFERENCE IN THE MATTER OF POLLUTION OF THE SOUTH PLATTE RIVER BASIN IN THE STATE OF COLORADO. 2ND SESSION, DENVER, COLORADO, RECONVENED NOVEMBER 10, 1966. PROCEEDINGS.
1966, 180p
Library of Congress Catalog card no. 70-613580.

Descriptors: (*Platte River Basin, *Water pollution), (*Colorado, Water pollution), Proceedings.

This session of the conference in the matter of pollution of the navigable waters of the South Platte River Basin within the State of Colorado is being held under the provisions of Section 10 of the Federal Water Pollution Control Act, as amended. Governor Love requested a conference on July 18, 1963, and conference sessions have been held on October 29, 1963, and April 27-28, 1966.

PB-217 907
Federal Water Pollution Control Administration, Boston, Mass. Northeast Region.
PROCEEDINGS: CONFERENCE IN THE MATTER OF POLLUTION OF THE NAVIGABLE WATERS OF MORICHES BAY AND THE EASTERN SECTION OF GREAT SOUTH BAY AND THEIR TRIBUTARIES. PATCHOGUE, NEW YORK, SEPTEMBER 20-22, 1966.
1966, 517p

Descriptors: (*Great South Bay, *Water pollution), (*Moriches Bay, *Water pollution), (*Long Island, Water pollution), (*New York, Water pollution), Proceedings.

This conference in the matter of pollution of the navigable waters of Moriches Bay and the eastern section of Great South Bay and their tributaries (Long Island, New York) involving the State of New York and the Federal Water Pollution Control Administration, is being held under the provisions of Section 10 of the Federal Water Pollution Control Act. Under the provisions of the Act, the Secretary of the Interior is authorized to call a conference of this type when he finds that substantial economic injury results from the inability to market shellfish or shellfish products in interstate commerce because of pollution subject to abatement under the Federal Act, and action of Federal, State, or local authorities. (Author)

PB-217 908
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
TABULATION OF BOTTOM ORGANISMS OBSERVED AT SAMPLING STATIONS DURING THE BIOLOGICAL SURVEY BETWEEN DANVILLE, PENNSYLVANIA, AND CONOWINGO, MARYLAND. APPENDIX TO BIOLOGICAL SURVEY OF THE SUSQUEHANNA RIVER AND ITS TRIBUTARIES BETWEEN DANVILLE, PENNSYLVANIA, AND CONOWINGO, MARYLAND.
Nov 66, 61p CB-SRBP-Working Document-1

Descriptors: (*Susquehanna River, *Biological surveys), Tables (Data), Aquatic animals, Invertebrates.

The report consists of tables giving a count of various invertebrates found in the river.

PB-217 910
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
BUILDING FOR CLEAN WATER. A REPORT ON FEDERAL INCENTIVE GRANTS FOR MUNICIPAL WASTE TREATMENT AND FUTURE CONSTRUCTION NEEDS, 1964.
1964, 16p PHS-Pub-867-Ed-64

Descriptors: (*Sewage treatment, *Grants), (*Financing, Sewage treatment).

Contents:
How federal incentive grants work;
The record 1956-1964;
State allocations 1964;
Present needs;
Future needs;
Total needs - current dollars;
Total needs - future dollars.

PB-217 911
Federal Water Quality Administration, Washington, D.C.
FISH KILLS, 1969, CAUSED BY POLLUTION.
1969, 22p

Descriptors: (*Water pollution, *Fresh water fishes), Tables (Data).
Identifiers: *Fishkill, *Water pollution effects (Animals).

A compilation and tabulation of information on pollution-caused fish kills is reported by State agencies in an effort to determine and publicize the causes and extent of such losses.

PB-217 912
Baffa (John J.), New York.
WASTE WATER RECLAMATION VIA ARTIFICIAL RECHARGE AT RIVERHEAD, N.Y.
Progress rept. no. 3, Jan-Dec 67.

1 May 68, 57p
Grant FWPCA-WPD-82-02-66
Report on Riverhead Research Project to New York State Dept. of Health, and Suffolk County Dept. of Health.

Descriptors: (*Sewage, *Ground water recharge), (*Injection wells, Sewage), (*Waste disposal, Sewage), Aquifers, New York.
Identifiers: *Liquid waste disposal, Riverhead (New York).

Contents: Injection and redevelopment of ground well; Examination of simulator infiltrative interface; Infiltrative capacity constant head test; Percolative capacity studies; Studies of simulator contents as affecting percolative capacity; Changes in quality of percolating water by reason of underground travel.

PB-217 913
Bureau of Solid Waste Management, Rockville, Md.
1968 NATIONAL SURVEY OF COMMUNITY SOLID WASTE PRACTICES, REGION 1. CONNECTICUT, MAINE, MASSACHUSETTS, NEW HAMPSHIRE, RHODE ISLAND, VERMONT,
Anton J. Muhich, Albert J. Klee, and Charles R. Hampel. 1969, 135p PHS-Pub-1866

Descriptors: (*Connecticut, *Waste disposal), (*Maine, *Waste disposal), (*Massachusetts, *Waste disposal), (*New Hampshire, *Waste disposal), (*Vermont, *Waste disposal), Earth fills, Inventories, Tables (Data).
Identifiers: *Solid waste disposal, *Sanitary landfills.

The National Survey compiles and reports solid waste practices in analyzing land disposal sites and facilities.

PB-217 914
Federal Water Pollution Control Administration. Washington, D.C.
A REPORT TO THE CONGRESS ON POLLUTION OF NAVIGABLE WATERS OF THE U. S., BY WASTES FROM WATERCRAFT.

30 Jun 67, 102p

Descriptors: (*Ships, *Water pollution), Regulations.

For abstract, see 73 01.

PB-217 915
Kansas Univ./Center for Research, Inc.
CHEMICAL WATER QUALITY ON THE LOWER KANSAS RIVER BASIN,
Walter J. O'Brien, and Ernest E. Angino. Nov 66, 78p
Contract PH-86-66-63

Descriptors: (*Kansas River Basin, *Water pollution), (*Stream pollution, Mathematical models).
Identifiers: *Water quality data.

The research was to prepare a model of the lower reaches of the Kansas River drainage basin. This model was to be used for operational and planning activities within the basin. During the course of the investigation, it became apparent that the biological, the chemical, and the time of flow data on the model region was insufficient to establish many of the parameters required to accurately describe the behavior of the drainage system. The report describes the chemical analysis of twenty-two samples each week for a period of thirteen weeks and for the mathematical correlation of the data.

PB-217 916
North Texas State Univ., Denton. Dept. of Biology.
A MEMBRANE FILTER-FLUORESCENT ANTIBODY METHOD FOR DETECTION AND ENUMERATION OF BACTERIA IN WATER. RAPID IDENTIFICATION OF MICROBIAL POPULATIONS IN WATER.
Rept. for 1 Nov 67-1 Nov 68,
Rufus K. Guthrie, and Dennis J. Reeder. 1 Nov 68, 21p
Grant FWPCA-WPD-146-02-68

Descriptors: (*Bacteria, *Water analysis), Identifying, Detection, Quantitative analysis, Water quality, Fluid filters, Membranes, Escherichia coli.
Identifiers: *Fluorescent antibody techniques.

A technique which employs use of non-fluorescing membrane filters and specific FITC-labelled antiserum has been successfully used in the identification and enumeration of known species of E. coli which have been added to natural populations of bacteria found in water. The quantitative results compared favorably with tests described in the standard methods. The use of a dissecting microscope with an external lighting arrangement provided a simple requirement for equipment. This method appears useful in monitoring specific bacterial types from waters which were being monitored for specific pollution. (Author)

PB-217 917
Public Health Service, Denver, Colo. Region VIII.
WATER RESOURCES STUDY AND PUBLIC HEALTH ASPECTS OF THE SAN MIGUEL PROJECT COLORADO: STUDY OF POTENTIAL NEEDS AND VALUE OF WATER FOR THE PURPOSE OF WATER QUALITY CONTROL AND THE PUBLIC HEALTH ASPECTS OF THE SAN MIGUEL PROJECT, COLORADO.

Jun 64, 77p

Descriptors: (*San Miguel River Basin, *Reservoirs), (*Colorado, *Water resources), Forecasting.
Identifiers: Montrose County (Colorado), San Miguel County (Colorado).

The general objectives of the study are to assess the probable effects that the proposed project will have on water quality in streams and reservoirs of portions of Montrose and San Miguel Counties in southwestern Colorado; to ascertain the benefits resulting from changes in water quality; to assess the suitability of the water for proposed water uses; and to examine the need for regulation of streamflow for the purpose of water quality control. The report includes the results of a study of general public health aspects and insect vector control of the project. A preliminary evaluation of the insect vector problems that may be associated with the project is presented.

PB-217 918
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. DAIRIES.
Industrial waste profiles.

Sep 67, 168p FWPCA-IWP-9
Paper copy available from GPO $1.00 as I 57.2:C82/v3/no.9.

Descriptors: (*Water pollution, *Food processing), (*Cost analysis, Water pollution), (*Dairy products, Water pollution), (*Industrial waste treatment, Food processing).
Identifiers: *Water pollution economics.

Industrial Waste Profile, Dairies, is a qualitative and quantitative description of wastes and wastewater generated in the Dairy Industry identified in SIC Code as 202 Dairy Products. The Industry is examined in its important major subdivisions identified by SIC Code. The Profile is prepared for the Base Year of 1963 which permits correlation with 1963 Census of Manufacturers data for production and water use. The waste and wastewater estimates are developed from actual plant operating experience, and are correlated with manufacturing processes and are augmented with waste reduction and removal cost estimates. Projections of waste and waste water for future years are developed in detail.

PB-217 919
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
MISCELLANEOUS RESERVOIR WATER QUALITY DATA REPORT, 1964.

Feb 66, 48p
Report on Columbia River Basin Comprehensive Project For Water Supply and Pollution Control.

Descriptors: (*Columbia River Basin, *Reservoirs), (*Water pollution, Columbia River Basin).
Identifiers: *Water quality data.

The material contained in this report consists of raw field data acquired on miscellaneous reservoir field investigations performed in July 1964. The following studies are included: Lookout Point Reservoir; Dexter Reservoir; Cougar Reservoir; Hills Creek Reservoir (above); Hills Creek Reservoir; Snake River (Hells Canyon). The data are arranged by survey (in above order), with the station data arranged with the downstream station first, and the remaining stations in upstream sequence. With the exception of the plankton counts, all results were obtained in the field. Chemical analysis (alkalinity, phosphate, nitrate, and hardness) were measured.

PB-217 920
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
WATER QUALITY AND POLLUTION CONTROL STUDY. MINE DRAINAGE-CHESAPEAKE BAY, POTOMAC RIVER BASIN, SUSQUEHANNA RIVER BASIN, AND DELAWARE RIVER BASIN.

Jul 67, 186p CB-SRBP-Working Document-3

Descriptors: (*Water pollution, *Mine waters), (*Chesapeake Bay, Water pollution), (*Delaware River Basin, Water pollution), (*Susquehanna River Basin, Water pollution), (*Potomac River Basin, Water pollution), (*Juniata River Basin, Water pollution), (*Tioga River Basin, Water pollution), Coal mines.
Identifiers: *Mine acid drainage.

The purpose of this report is to provide background information to be used in the development of a program to eliminate or reduce the effects of mine drainage pollution on the quality of the streams in the Susquehanna River, Delaware River, and Potomac River Drainage Basins. The report covers both the anthracite and bituminous coal mining areas in these Basins. The report does the following: Describe the chemical and physical processes involved in the formation and occurrence of mine drainage pollution; Identify and characterize the watersheds contributing mine drainage; Relate mine drainage contributions of the tributaries to the main stem of the receiving stream; Identify and estimate the extent of areas disturbed by mining operations; Suggest measures for control; and estimate costs.

PB-217 921
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
BIOLOGICAL SURVEYS OF THE UPPER JAMES RIVER BASIN. COVINGTON, CLIFTON FORGE, BIG ISLAND, LYNCHBURG, AND PINEY RIVER AREAS.

Jan 68, 23p CB-SRBP-Working Document-21

Descriptors: (*James River Basin, *Biological surveys), (*Virginia, Water pollution), (*Water pollution, James River Basin), (*Jackson River, Water pollution), (*Tye River, Water pollution), Benthos, Indicator species.

A water quality pollution control study of the James River Basin conducted by the Chesapeake Bay-Susquehanna River Basins Project in 1966-67 included an evaluation of pollution control action needed to enhance and protect water quality in the Basin. To supplement chemical and biochemical water quality data used in the evaluations, the Chesapeake Field Station conducted biological surveys of the Jackson River in the Covington and Clifton Forge areas, the James River in the Big Island and Lynchburg areas, and areas in the Tye River Watershed affected by acid wastes. For the purpose of the surveys, the community of bottom (benthic) organisms was selected as the indicator of the biological condition of the stream.

PB-217 922
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
A STUDY OF TIDAL DISPERSION IN THE POTOMAC RIVER.
L. J. Hetling, and R. L. O'Connell. 1965, 48p CB-SRBP-Technical Paper-7
Report on the Chesapeake Bay-Susquehanna River Basins Project.

Descriptors: (*Potomac River, *Mathematical models), Estuaries, Tidal currents.

The Chesapeake Bay-Susquehanna River Basins Project of the Federal Water Pollution Control Administration has as its primary objective the development of a comprehensive program for water pollution control in the Chesapeake Bay drainage basin. To permit a better understanding of this complex body of water and to provide a

satisfactory means for analysis of present and future pollution problems and selection of optimum control methods, an attempt has been made to model the system in mathematical terms. To mathematically describe the fate of pollutants entering such a tidal system, knowledge of its turbulent dispersion properties is required. To gather this type of information for the upper Potomac estuary, a dye tracer study was carried out by the Project during the 34-day period from June 10 to July 14, 1965. The purpose of the report is to describe the procedure used in this large scale tracer experiment, the results obtained, the methods used in the analysis of these results, and, finally, to present the conclusions reached regarding turbulent dispersion properties of this tidal system.

PB-217 923
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
A WATER QUALITY STUDY OF THE PISCATAWAY CREEK WATERSHED,
Johan A. Aalto, and Norbert A. Jaworski. Aug 68, 62p

Descriptors: (*Water pollution, *Piscataway Creek), (*Maryland, Water pollution), (*Potomac River Basin, Water pollution), Sewage.
Identifiers: *Prince Georges County (Maryland), *Water quality data, Sewage treatment effluent.

The report is part of a comprehensive water quality management study of the Potomac River Basin. In recent months there has been considerable public interest in the operation of the Piscataway Wastewater Treatment Plant (PWTP) of the Washington Suburban Sanitary Commission (WSSC) and the effect of plant effluent on the water quality of Piscataway Creek. A series of field surveys was conducted by CFS on the efficiency of the PWTP and on water quality in Piscataway Creek. Although the scope of this report is primarily limited to The Piscataway Creek and the adjacent reaches of the Potomac Estuary, other embayments in the area were investigated in order to compare the Piscataway results with similar embayments including three not receiving treated water discharges.

PB-217 924
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
IMMEDIATE WATER POLLUTION CONTROL NEEDS, THE EASTERN SHORE OF DELAWARE, MARYLAND AND VIRGINIA.

Sep 67, 67p CB-SRBP-Working Document-20

Descriptors: (*Chesapeake Bay Basin, *Water pollution), (*Maryland, Water pollution), (*Virginia, Water pollution), (*Delaware, Water pollution).

The purpose of this study is to examine the surface waters of the Chesapeake Bay drainage and the Maryland and Virginia Atlantic Ocean drainage of the Eastern Shore, and to prepare a working document describing the immediate water pollution control action needed in the Area.

PB-217 925
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
SUMMARY OF WATER QUALITY AND WASTE OUTFALLS, ROCK CREEK IN MONTGOMERY COUNTY, MARYLAND, AND THE DISTRICT, OF COLUMBIA.
Dec 66, 59p CB-SRBP-Working Document-5

Descriptors: (*Rock Creek, *Water pollution), (*Maryland, Water pollution), (*District of Columbia, Water pollution).

A study was made of the pollution problems in the Rock Creek Sub-Basin of the Potomac River Basin. The Chesapeake Field Station was directed to make a determination of water quality in Rock Creek and an inventory of waste outfalls. Rock Creek drains a watershed area of approximately 77 square miles and has its source south of Laytonsville in Montgomery County, Maryland. The lower ten stream miles of Rock Creek drain approximately 16 square miles of the highly urban District of Columbia. Data for evaluation of the bacteriological, biological, and other water quality characteristics of the stream were obtained by field surveys and from records of health agencies in the area.

PB-217 926
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
BIOLOGICAL SURVEY OF THE UPPER AND MIDDLE PATUXENT RIVER AND SOME OF ITS TRIBUTARIES, FROM THE MARYLAND ROUTE 97 BRIDGE NEAR ROXBURY MILLS TO THE MARYLAND ROUTE 4 BRIDGE NEAR WAYSON'S CORNER, MARYLAND. CHESAPEAKE B AY DRAINAGE BASIN.
Jun 68, 49p CB-SRBP-Working Document-29

Descriptors: (*Patuxent River, *Biological surveys), (*Water pollution, Patuxent River), (*Maryland, Water pollution).

A biological survey of the upper Patuxent River and certain key tributaries between the Maryland Route 97 Bridge near Roxbury Mills and the Maryland Route 4 Bridge near Wayson's Corner was made between September 5 and November 27, 1967. Samples were collected from 18 stations on the main stem of the Patuxent River and from 17 stations on six tributaries. Bottom organisms were selected as the primary indicators of biological water quality.

PB-217 927
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
SELECTED BIOLOGICAL SURVEYS IN THE JAMES RIVER BASIN, GILLIE CREEK IN THE RICHMOND AREA, APPOMATTOX RIVER IN THE PETERSBURG AREA, BAILEY CREEK FROM FORT LEE TO HOPEWELL.
Apr 68, 24p CB-SRBP-Working Document-28

Descriptors: (*James River Basin, *Biological surveys), (*Virginia, Water pollution), (*Water pollution, James River Basin).

Biological surveys of Gillie Creek in the Richmond area, the Appomattox River in the Petersburg area, and Bailey Creek between Fort Lee and Hopewell (all tributaries of the James River in Virginia) were conducted in August 1967. The surveys were centered on these areas, as each of them was known to have serious pollution problems, and additional data were needed. For purposes of the study, the community of bottom (benthic) organisms was selected as indicator of the biological condition of the stream. Bottom organisms serve as the preferred food source for higher aquatic forms and exhibit similar reactions to adverse stream conditions.

PB-217 928
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
BIOLOGICAL SURVEY OF THE MONOCACY RIVER AND TRIBUTARIES, FROM GETTYSBURG, PENNSYLVANIA, TO THE MARYLAND ROUTE 28 BRIDGE, POTOMAC RIVER BASIN.
Jan 68, 48p CB-SRBP Working Document-23

Descriptors: (*Monocacy River, *Biological surveys), (*Water pollution, Monocacy River), (*Pennsylvania, Water pollution), (*Maryland, Water pollution).

A biological survey of the Monocacy River and certain tributaries between Gettysburg, Pennsylvania, and the Maryland Route 28 Bridge was conducted in July 1966. The survey was made to determine the biological condition of the stream from its headwaters in Pennsylvania to its mouth downstream from the Maryland Route 28 Bridge near Tuscarora, Maryland. For purposes of the study, the community of bottom (benthic) organisms was selected as the indicator of the biological condition of the stream. Bottom organisms serve as the preferred food source for the higher aquatic forms and exhibit similar reactions to adverse stream conditions.

PB-217 929
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
BIOLOGICAL SURVEY OF ANTIETAM CREEK AND SOME OF ITS TRIBUTARIES, FROM WAYNESBORO, PENNSYLVANIA TO ANTIETAM, MARYLAND. POTOMAC RIVER BASIN.
Feb 68, 30p CB-SRBP-Working Document-22

Descriptors: (*Antietam Creek, *Biological surveys), (*Indicator species, Water pollution), (*Water pollution, Antietam Creek), (*Maryland, Water pollution), (*Pennsylvania, Water pollution), Benthos.

A biological survey of Antietam Creek and some of its tributaries in the reach between Waynesboro, Pennsylvania, and Antietam, Maryland, was conducted between July 19 and July 21, 1966. The biological activities were conducted concurrently with stream quality investigations. For purposes of the study, the community of bottom (benthic) organisms was selected as the indicator of the biological condition of the stream. The combination of limited locomotion and life cycles of one year or more, for most benthic species, provides a long-term picture of the water quality of a stream. Fish and algal populations were given some consideration, but only to the extent that obvious conclusions could be drawn based upon casual observations. (Author)

PB-217 930
Southeastern Radiological Health Lab., Montgomery, Ala.
HEALTH PHYSICS ASPECTS OF TRITIUM LUMINOUS DIAL PAINTING,
A. A. Moshissi, E. D. Toerber, J. E. Regnier, M. W. Carter, and C. D. Posey. 16 Jul 69, 7p
Revision of report dated 24 Feb 69. Pub. in Health Physics, v18 p255-261 1970.

Descriptors: (*Radiation hazards, *Tritium), (*Luminescence, Radiation hazards), (*Industrial medicine, Radiation hazards), Radiobiology.

Survey of a luminous dial painting plant is described. Under the conditions investigated, skin contamination was indicated as a major mode of entry of tritium into the body of the workers. A new unit, gram-Lambert (g-L) is proposed for comparison of radio-active luminous paints. A naximum tritium activity which may be processed by a worker without exceeding the maximum permissible body burden is proposed.

PB-217 931
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY WAPSIPINICON RIVER BASIN, IOWA. STUDY OF THE NEEDS AND VALUE OF STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL.
Jun 66, 48p

Descriptors: (*Wapsipinicon River Basin, *Reservoirs), (*Iowa, *Water resources), Forecasting.

The purpose of the study was to determine the present and future needs and value of municipal and industrial water supply and storage for water quality control on the Wapsipinicon River in the reaches affected by the proposed Central City Reservoir. This includes parts of the following Iowa counties: Clinton, Scott, Cedar, Jones, Linn, Delaware, Buchanan, Blackhawk, Bremer, Fayette, Chickasaw, Floyd, Howard, and Mitchell and small parts of Dodge and Olmsted counties in Minnesota. The water requiremtnts, and the means and benefits (both tangible and intangible) of meeting those requirements have been investigated. The scope of the study covers water storage needs during a one-hundred year study period, 1960 to 2060. (Author)

PB-217 932
Public Health Service, Kansas City, Mo. Region VI.
WATER RESOURCES STUDY ROUND MOUND DAM AND RESERVOIR SMOKY HILL RIVER BASIN KANSAS. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER STORAGE FOR QUALITY CONTROL.
Nov 63, 57p

Descriptors: (*Smoky Hill River Basin, *Reservoirs), (*Kansas, *Water resources), Forecasting.
Identifiers: *Ellis County (Kansas), *Trego County (Kansas), *Russell County (Kansas).

The purpose of this study was to determine the need for and value of storage for water quality control in Big Creek, a tributary of the Smoky Hill River in central Kansas. The study covers water uses for the base period of 1960 and projected needs during the study period of 1970 to 2020, based on estimated growth and development. The study area is Ellis, Trego, and Russell Counties.

PB-217 933
Villanova Univ., Pa.
WATER POLLUTION CONTROL DEMONSTRATION.
Final progress rept.

1968, 54P
Grant WPD-174-01-67

Descriptors: (*Oils, Materials recovery), (*Lubricating oils, *Materials recovery), Reclamation, Refining, Water pollution, Abatement.
Identifiers: *Oil wastes, *Water pollution abatement, *Liquid waste disposal, *Waste recycling.

The purpose is to demonstrate a process for elimination of water pollution by waste oil refining plants.

PB-217 934
Federal Water Pollution Control Administration, Chicago, Ill. Great Lakes-Illinois River Basins. Project.
LAKE ERIE. SICK, DYING, OR WELL,
C. W. Northington. 1965, 14p

Descriptors: (*Lake Erie, *Water pollution).

Observations were made relative to the effects of pollution on water quality and water uses in the major problem areas within the basin and the Lake itself. Although some polluting materials are produced in the Lake, practically all wastes originate from land based activities of man. All major tributaries to Lake Erie are grossly polluted at their mouths and many are grossly polluted throughout large portions of their lengths. The rivers are discussed in hydrological sequence beginning with the St. Clair River and following the American shoreline to Niagara Falls. After the rivers, the authors discusses the Lake itself.

PB-217 935
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
A MATHEMATICAL MODEL FOR THE POTOMAC RIVER. WHAT IT HAS DONE AND WHAT IT CAN DO. TALK PRESENTED AT THE 1966 FALL MEETING OF THE INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN, HELD AT ST. MARY'S CITY, MARYLAND , ON SEPTEMBER 22, 1966.
1966, 18p CB-SRBP-Technical Paper-8

Descriptors: (*Potomac River, *Water pollution), Mathematical models.

The report explains, in layman's terms, a mathematical model of the pollution in the Potomac estuary and gives examples of the fit between observed and calculated data.

PB-217 936
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Field Station.
WATER QUALITY SURVEY OF NORTHEAST RIVER, ELK RIVER, C + D CANAL, BOHEMIA RIVER, SASSAFRAS RIVER AND UPPER CHESAPEAKE BAY. SUMMER 1968.
Data rept.
1968, 18P

Descriptors: (*Chesapeake Bay, *Water pollution), (*Northeast River, *Water pollution), (*Bohemia River, *Water pollution), (*Sassafras River, *Water pollution), (*Maryland, Water pollution), (*Delawae, Water pollution).
Identifiers: *Water quality data.

The Chesapeake Field Station of the Middle Atlantic Region, FWPCA, conducted a field survey of water quality in the Northeast River, Elk River, C + D Canal, Bohemia River, Sassafras River and the upper Chesapeake Bay in late summer 1968. The objectives of these cruises were to: assess water quality in these waters; estimate standing crops of phytoplankton and observe areas of rooted aquatic plants in the tributaries under summer low flow conditions; and evaluate, under field conditions, a Yellow Springs Instrument Company portable dissolved oxygen meter.

PB-217 937
Robert A. Taft Wat4er Research Center, Cincinnati, Ohio.
AIR POLLUTION IN CONNECTICUT. REPORT OF A COOPERATIVE SURVEY BY THE U.S. PUBLIC HEALTH SERVICE, AND THE CONNECTICUT STATE DEPARTMENT OF HEALTH, APRIL-SEPTEMBER, 1956,
Roy O. McCaldin, Paul A. Kenline, and David C. Wiggin. 1957, 121p

Descriptors: (*Connecticut, *Air pollution).

The study was made by analyzing available data, interviewing officials in the larger and selected smaller cities and towns, and sending questionnaires to the remaining communities. Interview and questionnaire data were obtained for 116 of the 169 cities and towns which include 2,051,960 people or 89.3 percent of the State's population.The State is described with respect to population, topography, climatology, industry, transportation, refuse disposal practice, fuel usage, and use of radioactive materials. Air pollution factors are analyzed for the 25 largest cities and towns and their air pollution potential estimated. State and local air pollution laws are analyzed, a summary of local air pollution studies is given, and the State Department of Health records of air pollution investigations are examined.

PB-217 938
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
IMMEDIATE WATER POLLUTION CONTROL NEEDS. NORTHWEST CHESAPEAKE BAY AREA (PATAPSCO TO SUSQUEHANNA DRAINAGE BASINS IN MARYLAND).
Aug 67, 46p CB-SRBP-Working Document-19

Descriptors: (*Chesapeake Bay, *Water pollution), (*Maryland, Water pollution).

It was the purpose of this study to examine those areas along the northwestern part of the Chesapeake Bay, extending from the Patapsco to the Susquehanna Rivers, and to provide the following information on the basis of the best available information: Locate present and potential water quality problem areas and evaluate the need for corrective action, Identify pollution sources and determine the parties responsible, and Present immediate pollution control needs, responsibilities, and costs.

PB-217 939
Federal Water Pollution Control Administration, Charlottesville, Va. Middle Atlantic Region.
WATER QUALITY SURVEY OF CHESAPEAKE BAY IN THE VICINITY OF ANNAPOLIS, MARYLAND.
1967, 24p CB-SRBP-Working Document-24

Descriptors: (*Chesapeake Bay, *Water pollution), (*Maryland, Water pollution).
Identifiers: *Water quality data, *Annapolis (Maryland).

In the summer of 1967 water quality reconnaissance surveys were conducted in the Chesapeake Bay in the vicinity of Annapolis, Maryland. Objectives of the surveys were: Observe oxygen depletion trends during the summer months, Determine horizontal and vertical stratification through thermoclines and haloclines, and Measure existing water quality in terms of D.O., BOD, temperature, salinity, nutrients, turbidity and phytoplankton. (Author Modified Abstract)

PB-217 940
International Joint Commission-United States and Canada.
REPORT OF THE INTERNATIONAL JOINT COMMISSION, UNITED STATES AND CANADA ON THE POLLUTION OF THE ATMOSPHERE IN THE DETROIT RIVER AREA.

1960, 272p

Descriptors: (*Michigan, *Air pollution), (*Canada, *Air pollution).
Identifiers: *Wayne County (Michigan), *Detroit (Michigan), *Air quality data, *Windsor (Canada).

Contents: Legislation and regulation pertaining to air pollution in the Detroit River area; Organization of the investigation; General description of the Detroit River area; Climatology of the Detroit-Windsor area; Pollution from sources other than marine; Nature and composition of pollution; Effects of pollution on health; Effects of pollution on vegetation; Other effects of pollution; Relation between pollution levels and meteorological factors; Vessel smoke and its control; Discussion of findings and recommendations.

PB-217 941
Federal Water Pollution Control Administration, Athens, Ga. Southeast Water Lab.
PRE-IMPOUNDMENT STUDIES OF THE WATERS OF THE CROSS-FLORIDA BARGE CANAL (OKLAWAHA AND WITHLACOOCHEE R.).

Dec 67, 87p

Descriptors: (*Florida, *Water pollution), Saint Johns River, Olkawaha River, Withlacoochee.
Identifiers: *Cross Florida Barge Canal, *Water quality data.

Physical, chemical and bacteriological water quality studies of the proposed Cross Florida Barge Canal area were conducted in March and April of 1967 to determine conditions before significant construction activity on the major impoundments

in the canal took place. In general, water quality in the proposed impounded areas was excellent and should be acceptable if maintained at these levels for the proposed contact and non-contact recreational uses. The report discusses the problems which may effect water quality.

PB-217 942
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MODERN SEWAGE TREATMENT PLANTS: HOW MUCH DO THEY COST,
Donald R. Kaiser. 1964, 43p PHS-Pub-1229

Descriptors: (*Sewage treatment, *Construction costs), Cost estimates.
Identifiers: *Sewage treatment plants.

Contents: Earlier construction cost studies; Current cost study; Procedures of analysis; Treatment plant costs per capita; Treatment plant costs per population equivalent; Treatment plant costs per unit flow; Limitations of cost estimating data; Recapitulation of the studies.

PB-217 943
McCrone (Walter C.) Associates, Inc., Chicago, Ill.
CHARACTERIZATION OF RARITAN BAY WATERS.

15 Sep 63, 28p
Availability: Available in microfiche only.

Descriptors: (*Raritan Bay, *Water pollution), Solids, X ray diffraction.

The report contains statistical data relative to particulate content identified by microanalysis in samples obtained from waters of the Raritan Bay.

PB-217 944
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Field Station.
WATER QUALITY SURVEY IN THE JAMES AND MAURY RIVERS GLASGOW, VIRGINIA, SEPTEMBER 1967.
Apr 68, 11p CB-SRBP-Working Document-27

Descriptors: (*James River, *Water pollution), (*Maury River, *Water pollution), (*Virginia, Water pollution), Pesticides.
Identifiers: *Glasgow (Virginia), Fishkill, *Water quality data.

The Chesapeake Field Station of the Middle Atlantic Region, Federal Water Pollution Control Administration, conducted an intensive survey of the James and Maury Rivers in the vicinity of Glasgow, Virginia during September 1967. The purpose of this survey was to measure the effects of reported high organic loadings on these two rivers in the vicinity of their confluence and to determine pesticide levels in an area with a reported massive fish kill.

PB-217 945
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Field Station.
WATER QUALITY SURVEY IN THE SHANANDOAH RIVER OF THE POTOMAC RIVER BASIN. JUNE 1967.

Apr 68, 24p CB-SRBP-Working Document-26

Descriptors: (*Shanandoah River Basin, *Water pollution), (*Virginia, Water pollution), (*West Virginia, Water pollution).
Identifiers: *Water quality data.

The Chesapeake Field Station of the Middle Atlantic Region, Federal Water Pollution Control Administration, conducted an intensive survey of the Shenandoah River Basin during June 1967. Separate surveys were made on (1) the Main Stem of the Shenandoah River, (2) the South Fork of the Shenandoah River, including the South River and the Middle River, and (3) the North Fork of the Shenandoah River. The purposes of these surveys were to aid in verifying the DO and BOD model parameters and to determine general water quality. The survey should also show the extent of any diurnal quality fluctuations.

PB-217 946
Public Health Service, Portland, Oreg. Economic Studies Group.
MIDDLE WILLAMETTE BASIN (OREGON). PRELIMINARY ECONOMIC RECONNAISSANCE AND ESTIMATE OF GROWTH, 1960--2010.

Aug 62, 21p Working Paper-27
Report on Columbia River Basin Project for Water Supply and Water Quality Management.

Descriptors: (*Willamette River Basin, *Economic development), (*Oregon, Economic development), River basin development, Forecasting.

The analysis provides a preliminary estimate of the economic potentials and anticipated growth of the area. The study period is the 50-year period 1960-2010, with an interim point at 1985. Two limitations apply to this study. The first is that it is intended only as a preliminary estimate of the outlook for the area's growth. The second limitation is that the study is intended for use particularly in assessing future water needs. Emphasis has been placed on the analysis of those industries which make heavy demands upon the water resource. Other industries have been considered only insofar as they may have a significant effect on future population. For this reason, the study is not submitted as a detailed industrial forecast.

PB-217 947
Stanford Univ., Calif.
WATER RENOVATION BY ION EXCHANGE,
Bruce M. Wyckoff. 1964, 24p
Grant WPD-21-02-64

Descriptors: (*Sewage treatment, *Water reclamation), (*Ion exchange, Water reclamation), Anion exchanging.

The potential shortage of fresh water in the United States is well documented. The purpose of the paper suggests ion exchange as a method of reclaiming water from sewage and to present results from laboratory studies utilizing chloride cycle anion exchange.

PB-217 948
Federal Water Quality Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
EUTROPHICATION OF LAKES,
Charles F. Powers. 9 Apr 70, 7p
Pub. in Proceedings of the Seminar on Man and Aquatic Communities, conducted by Water Resources Research Institute of Oregon State University, Spring Quarter 1970, p9-14 Jul 70.

Descriptors: (*Lakes, *Limnology), Ecology.
Identifiers: *Eutrophication.

Most lakes appear to experience a physiological aging process known as eutrophication. The research activities of the National Eutrophication Research Program are aimed at the development of methods for the control and alleviation of accelerated eutrophication and include both applied and fundamental studies. The report briefly describes this research.

PB-217 949
Metropolitan Sanitary District of Greater Chicago, Ill.
FLOOD AND POLLUTION CONTROL. A DEEP TUNNEL PLAN FOR THE CHICAGOLAND AREA.

May 66, 327p
Grant WPD-106-01-66

Descriptors: (*Combined sewers, *Water storage), (*Illinois, Combined sewers), Tunnels.
Identifiers: *Storm water runoff, *Chicago (Illinois).

The report discusses feasibility studies for the initial stage (Calumet Area) of the Deep Tunnel Plan for flood and pollution control in the Chicagoland Area. Basically, the Plan would utilize existing lateral and main sewers, with additional main sewers to relieve laterals at their high ends. Both the existing and new main sewers would be intercepted at appropriate locations by vertical shafts connecting to a tunnel system 600 feet or more below the ground surface. These tunnels, or galleries, would both temporarily store storm water overflows and drain these waters to a reversible pump-turbine plant location near the Calument Sewage Treatment Works.

PB-217 950
Federal Water Quality Administration, Anchorage, Alaska. Alaska Operations Office.
EFFECTS OF PULP MILL WASTES ON RECEIVING WATERS AT WARD COVE, ALASKA.

Oct 70, 68p

Descriptors: (*Alaska, *Water pollution), (*Pulp mills, Water pollution), Tongass Narrows, Industrial wastes, Paper industry.

Chemical, physical, and biological data were collected from Ward Cove and the adjacent waters of Tongass Narrows, Alaska. The parameters were selected to define the effects of only the pulp mill wastes, and no direct attempt was made to assess the impact of wastes discharged from a cannery also located in Ward Cove.

PB-217 956
Federal Water Pollution Control Administration, College, Alaska. Alaska Water Lab.
FEDERAL ACTIVITIES SECTION IN ALASKA.
Annual rept. FY 69,
Stanley Brust. 8 Aug 69, 17p

Descriptors: (*Alaska, Project management), Water pollution, National government.

The Federal Activities Program in Alaska is responsible for the implementation of sections four and seven of Executive Order 11288. The report very briefly summaries their efforts in FY 1969 and list expenditures.

PB-217 957
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
SOURCES OF WASTES FROM KRAFT PULPING AND THEORETICAL POSSIBILITIES OF REUSE OF CONDENSATES,
G. N. McDermott. 1951, 18p
Presented at the Southern Municipal and Industrial Waste Conference (3rd), North Carolina State College, Raleigh, N.C.

Descriptors: (*Paper industry, *Waste pollution), (*Pulp mills, Water pollution), (*Industrial waste treatment, Paper industry), Water reclamation.
Identifiers: *Waste water reuse, *Water pollution control.

Studies have been conducted of liquid wastes at several kraft pulp and paper mills during the past few years. The sources of wastes in the process and the in-put control practices observed in these studies are outlined. In addition some ideas having

theoretical possibilities for further reducing waste loads are presented.

PB-217 958
Louisville Univ., Ky. Inst. of Industrial Research.
LOUISVILLE, KY.--IND. METROPOLITAN REGION SOLID WASTE DISPOSAL STUDY. VOLUME I. JEFFERSON COUNTY, KENTUCKY.
Interim rept.,
John E. Heer, Stephen M. Thrasher, Jr., and George T. Calvert. 1970, 214p
Grant PHS-EC-00007

Descriptors: (*Waste disposal, *Kentucky), regional planning.
Identifiers: *Solid waste disposal, *Jefferson County (Kentucky).

The report was prepared by personnel from the Institute of Industrial Research, University of Louisville. It results from studies and investigations conducted by the Institute to determine types and quantities of solid waste generated by residential, commercial, and industrial sources in Jefferson County, Kentucky. This data is utilized in a computer planning model developed by the Institute to select the most practical and economical transfer and disposal system for the County. (Author)

PB-217 959
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WATER POLLUTION CONTROL. WASTE TREATMENT AND WATER TREATMENT. SELECTED BIOLOGICAL REFERENCE ON FRESH AND MARINE WATERS,
R. Keith Stewart, William Marcus Ingram, and Kenneth M. Mackenthun. 1966, 129p WP-23

Descriptors: (*Water pollution, *Bibliographies), Sewage treatment, Water treatment, Aquatic biology, Sources.

The report contains references on the following topics concerning water pollution: Biology (Algae and Plankton, Toxic algae, Fungi, Bottom organisms, Insects, Fish, Flowering aquatic plants, Nutrients, Insecticides and their effect upon aquatic life, Environmental change and its effect upon aquatic life, Radioactivity and its effect upon aquatic life, Toxicity and bio-assay methods, Techniques, Samplers, Criteria for Aquatic life); Industrial Wastes (Cooling water, Food, drugs, and fermentation, Metals and manufacturing, Petroleum, Pulp, paper, and textiles); Organism Identification (Insects, Fish, Algae and flowering aquatic plants, Other organisms); Waste treatment and water treatment aspects.

PB-217 960
Bureau of Community Environmental Management, Cincinnati, Ohio. Div. of Food, Milk, and Interstate Travel Sanitation.
MILK LABORATORIES APPROVED BY FEDERAL AND STATE AGENCIES, IN ACCORDANCE WITH THE PUBLIC HEALTH SERVICE GRADE 'A' PASTEURIZED MILK ORDINANCE AND EVALUATION OF MILK LABORATORIES.
1969, 50p PHS-Pub-1925-Ed-69

Descriptors: (*Milk, *Laboratories).

The report delineates the agencies, personnel involved, and the geographical locations of state approved milk inspection stations in the United States, the District of Columbia, Puerto Rico, and the Virgin Islands.

PB-217 961
Stanford Univ., Calif.
THE EFFECTS OF SULFIDES ON ANAEROBIC TREATMENT,
Alonzo Wm. Lawrence, Perry L. McCarty, and Fernand J. A. Guerin. 1964, 23p

Descriptors: (*Anaerobic processes, Inhibitors), (*Sewage treatment, Anaerobic processes), Hydrogen sulfide, Retarding, Toxicology, Microorganism control (Sewage treatment).

Anaerobic waste treatment is a biological process. As such it depends for successful operation on the maintenance of a proper environment for the organisms involved. By delineating this proper environment, a more complete understanding of the process will be attained. This will lead to an increase in the operational control and predictability of anaerobic treatment. Special attention must be focused on the problem of toxicity-causing substances if anaerobic treatment, long a mainstay of municipal sewage treatment, is to be successfully extended to the treatment of complex industrial wastes. The effects of high sulfide concentrations on anaerobic treatment are not well understood, and were explored in this investigation.

PB-217 962
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
EXPERIENCES IN STUDYING ORGANIC TASTE AND ODOR SUBSTANCES IN WATER, USING CARBON FILTER SAMPLING METHODS,
F. M. Middleton, A. A. Rosen, and C. C. Ruchhoft. 1954, 23p
Presented at the Annual Convention (44th), Illinois Section, American Water Works Association, 17-19 March 1954, Chicago, Illinois.

Descriptors: (*Water analysis, *Activated carbon), (*Water pollution, Water analysis), (*Odors, Water analysis), Organic compounds, Taste, Sampling, Infrared spectra.
Identifiers: *Water pollution detection.

The carbon filter provides a means for recovering from water and waste small quantities of organic substances for which no direct methods of analysis are available. The techniques of using the filter and recovering the materials are discussed. Specific applications of the filter to problems of taste and odor in refinery effluents, an approach to identification of refinery wastes in water, recovery of an insecticide, recovery of a musty component and detergents in water are pointed out. (Author)

PB-217 963
Missouri Basin Scope, Kansas City.
IS THE GREEN RIVER DAMNED. WILL YOUR CHILDREN KNOW THE GREEN RIVER,
Kenneth L. Diem. 1970, 18p
Pub. in the Pinedale Roundup, v67 n5, 10 Dec 70.

Descriptors: (*Green River, *Reservoirs), Evaluation, Environmental surveys, Water resources, Recreational facilities.

The report presents some comments on proposed dams to be built on the Green River in Wyoming. The dams would affect a now wild river and cause erosion around an existing lake.

PB-217 964
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
ANNUAL REVIEW OF LITERATURE ON WATER POLLUTION (1954),
M. B. Ettinger, C. Henderson, P. W. Kabler, Max Katz, and G. N. McDermott. Feb 55, 72p
Availability: Available in Microfiche only.

Descriptors: (*Water pollution, *Reviews), Aquatic biology, Water chemistry, Dissolved gases, Oxygen, Standards.

Contents:
Biology;
Bacteriology;
Chemistry;
Oxygen sag and self-purification;
Surveys and studies;
Abatement and control, and;
Stream standards.

PB-217 965
South Tahoe Public Utility District, South Lake Tahoe, Calif.
OPERATIONS MANUAL FOR 7.5 MGD WATER RECLAMATION PLANT. SOUTH TAHOE PUBLICITY UTILITY DISTRICT, SOUTH LAKE TAHOE, CALIFORNIA.
Sep 67, 215p
Prepared in cooperation with Clair H. Hill and Associates, Redding, Calif., and Cornell, Howland, Hayes and Merryfield, Corvallis, Oregon.

Descriptors: (*Sewage treatment, *Manuals), Operations.
Identifiers: *Sewage treatment plants, *South Tahoe Sewage Treatment Plant.

This manual is an operating guide for the use of personnel who operate and maintain the South Tahoe Water Reclamation Plant. The primary purpose of the manual is to explain the functional operation of the plant, to describe its capabilities and limitations, and to suggest procedures for control of the treatment process. The manual is not intended to cover in detail the routine maintenance and repair of various items of equipment, as this information may be obtained from the drawings and instructions supplied by the manufacturers of the equipment installed in the plant.

PB-217 966
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NATIONAL WATER QUALITY NETWORK ANNUAL COMPILATION OF DATA, OCTOBER 1, 1959-SEPTEMBER 30, 1960.

1960, 428p PHS-Pub-663-1960
A Federal State and Local Cooperative Report on Water Quality Determinations of Surface Waters at Selected Locations Throughout the United States.

Descriptors: (*Water pollution, *United States), Inventories, Tables (Data), Radioactive contaminants, Plankton, Pesticides, Organic compounds, Trace elements.
Identifiers: *Water quality data.

This is the third annual compilation of data from the National Water Quality Network of the Public Health Service. Again the data have revealed some very interesting findings which can be applied directly to problems of water quality evaluation. During this past year an increasing number of State and other non-Federal agencies have taken an active interest in the field of water quality measurement. The mounting nationwide necessity for conserving our water resources has been a major incentive in stimulating this interest. Our own Network has been increased from 54 to 72 stations during this data year, with additional expansion still underway.

PB-217 967
Pollution Control Council, Portland, Oreg. Pacific Northwest Area.
WATERSHED CONTROL FOR WATER QUALITY MANAGEMENT,
Reginald Bowering, Kenneth H. Spies, Alfred T. Neale, and William E. Bullard. Apr 61, 42p

Descriptors: (*Pacific Northwest, *Water resources), (*Forestry, Water resources), Management planning.

The purpose of this water supply and watershed protection document is to demonstrate the basic principles and problems of long-range programs of

water quality protection and management on forested watersheds in the Pacific Northwest. Consideration is given to natural as well as man-caused variations in water resource characteristics and their relationships to municipal, industrial and agricultural consumptive uses and the non-consumptive uses of water including fisheries and recreation. The report summarizes water supply and quality requirements for the various uses in the Pacific Northwest, indicates how lack of adequate control measures and management practices adversely affects these uses, and includes recommendations for improvements in watershed protection and management.

PB-217 968
National Center for Urban and Industrial Health, Cincinnati, Ohio.
MILK LABORATORIES APPROVED BY FEDERAL AND STATE AGENCIES. IN ACCORDANCE WITH THE PUBLIC HEALTH SERVICE GRADE 'A' PASTEURIZED MILK ORDINANCE AND EVALUATION OF MILK LABORATORIES.
1967, 42p PHS-Pub-999-FP-5

Descriptors: (*Milk, Laboratories), Food sanitation, Food processing, Pasteurizing, Standards, Public health, State government, Bacteriology.

The Grade'A' Pasteurized Milk Ordinance (1965 Recommendations of the United States Public Health Service) requires that 'Samples shall be analyzed at an official or appropriate officially designated laboratory.' An official laboratory is a biological, chemical, or physical laboratory which is under the direct supervision of the State or a local health authority. An officially designated laboratory is a commercial laboratory authorized to do official work by the supervising agency, or a milk industry laboratory officially designated by the supervising agency for the examination of producer samples of Grade A raw milk for pasteurization. The state central milk loboratories listed have been certified by milk laboratory survey officials of the Public Health Service. The official, commercial, and dairy industry laboratories identified have been approved by a milk laboratory survey official of their state as being in substantial compliance with standard methods as evidenced by a survey at least biennially and acceptable analysis of split samples of milk sent by the state to each laboratory every 6 months.

PB-217 969
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
WATER QUALITY CONTROL STUDY, ELKHORN RIVER BASIN, NEBRASKA. STUDY OF THE NEED AND VALUE OF STORAGE FOR WATER QUALITY CONTROL.
Dec 65, 40p

Descriptors: (*Elkhorn River Basin, *Reservoirs), (*Nebraska, *Water resources), Forecasting.

The purpose of the study is to determine the need for and value of storage for streamflow regulation for water quality control in the Elkhorn River Basin in northeastern Nebraska. The basin has an area of approximately 6,900 square miles and includes all or parts of Rock, Holt, Antelope, Knox, Pierce, Wayne, Garfield, Wheeler, Madison, Stanton, Platte, Cuming, and Dodge Counties. This study covers the 50-year study period, 1965 to 2015, as requested by the Bureau of Reclamation. (Author)

PB-217 970
Federal Water Pollution Control Administration, Lawrence, Mass. Merrimack River Project.
REPORT ON POLLUTION OF THE MERRIMACK RIVER AND CERTAIN TRIBUTARIES. PART III. STREAM STUDIES BIOLOGICAL,
Warren H. Oldaker. Aug 66, 69p
See also Part 5, PB-217 971.

Descriptors: (*Merrimack River Basins, *Biological surveys), (*New Hampshire, Water pollution), (*Massachusetts, Water pollution), (*Water pollution, Merrimack River Basin).

Contents: Observations for specific reaches (clean water control, PEMIGEWASSET and WINNIPESAUKEE Rivers); Bottom organisms of Souhegan River; Productivity of the Merrimack River; Microscopic plankton in Merrimack River.

PB-217 971
Federal Water Pollution Control Administration, Lawrence, Mass. Merrimack River Project.
REPORT ON POLLUTION OF THE MERRIMACK RIVER AND CERTAIN TRIBUTARIES. PART V. NASHUA RIVER.
Aug 66, 66p
See also Part 6, PB-217 980.

Descriptors: (*Nashua River, *Water pollution), (*Merrimack River Basin, *Water pollution), (*Massachusetts, Water pollution), (*New Hampshire, Water pollution).

Contents: Sources of pollution (general, bacteria, suspended solids, biochemical oxygen demand, nutrients, apparent color); Water uses; Effects of pollution on water quality and uses (bacterial pollution, suspended solids, dissolved oxygen, biological, nutrients, apparent color); Bottom sediments in pepperell pond (volume of sediment, oxygen utilization by sediments, nutrients contained in sediments); Future water quality.

PB-217 972
Pittsburgh Univ., Pa. Dept. of Biology.
THE MICRODISTRIBUTION OF STREAM BENTHOS.
Progress rept.,
Kenneth W. Cummins. 1 Jun 68, 44p
Grant FWPCA-WP-00525

Descriptors: (*Streams, *Ecology), (*Aquatic biology, Streams), Benthos, Food chains, Photosynthesis, Growth, Respiration, Biochemical oxygen demand, Aquatic plants, Aquatic animals, Stability, Pennsylvania.
Identifiers: Linesville Creek.

The paper deals with a portion of a long term study aimed at determining an energy budget for a lotic ecosystem, at the greatest level of detail feasible and employing the maximum possible amount of original data. The broad plan of investigation was conceived to consist of the following components: Determine community composition, standing crop fluctuations and an ingestion food web for the riffle portion of a natural stream ecosystem; Determine production (growth and reproduction) and the assignment of maintenance costs (respiration) at the level of populations; Determine intra-(photosynthesis by periphytic algae) and intercommunity (terrestrial and upstream contributions) supply of organic matter, as well as the loss (downstream) from the community; Establish a stable, semi-natural lotic system; Conduct manipulative experiments relative to the relationship between community stability and energy flow.

PB-217 973
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
REPORT ON POLLUTION OF THE INTERSTATE WATERS OF THE RED RIVER OF THE NORTH (MINNESOTA-NORTH DAKOTA),
T. P. Gallagher. Aug 65, 175p

Descriptors: (*Red River of the North, *Water pollution), (*Minnesota, Water pollution), (*North Dakota, Water pollution), Biological surveys.
Identifiers: *Water quality data.

The Public Health Service conducted a pollution evaluation survey of the Red River of the North and its major tributaries during the fall and winter of 1964-65. The purpose of the survey was to obtain data on wastes being discharged to the waterway, and to determine the effect of such wastes on the chemical, biological, and bacteriological quality of the river.

PB-217 974
New York State Dept. of Health, Albany.
TREATMENT NEEDED BY SEWAGE BEFORE INJECTION WELL RECHARGE.
Progress rept. no. 2, Nov 65-Dec 66,
Donald B. Stevens. Nov 67, 45p
Contract WPD-83-02-66

Descriptors: (*Sewage disposal, *Injection wells), (*Waste disposal, Injection wells), Soil properties, Plugging.
Identifiers: *Liquid waste disposal, Water pollution control.

Injection wells provide a safe, economical, and effective means of recharging substantial quantities of waste water to the ground water supply. However, the problem of major importance in connection with injection well recharge is the clogging of the soil pores at the soil and water injection interface and in the soil in the immediate vicinity of the injection well. Two clogging factors, physical and biological, were observed after recharge of either fresh water or filtered secondary treated sewage effluent. Both clogging processes took place at the same time during injection. Experimentation with combination beds of sand and anthracite, sand, anthracite and carbon, and single beds of sand or anthracite led to the choice of anthrafilt filter media as producing the longest filter runs and the best effluent quality.

PB-217 975
Public Health Service, Chicago, Ill. Great Lakes-Illinois River Basins Project.
REPORT ON THE ILLINOIS RIVER SYSTEM. EFFECTS ON WATER QUALITY OF RECOMMENDED IMPROVEMENT MEASURES.

Jan 63, 36p
Errata sheets inserted.

Descriptors: (*Illinois River, *Water pollution), (*Illinois, Water pollution).

Contents: Treatment of municipal wastes; (Secondary treatment, chlorination, bacterial reduction, BOD reduction); Industrial wastes; (Treatment, industrial waste ordinances); Combined sewer spillage; Integration of decreased waste loads.

PB-217 976
Environmental Control Administration, Cincinnati, Ohio. Analytical Reference Service.
WATER METALS NUMBER 5. REPORT OF A STUDY CONDUCTED BY ANALYTICAL REFERENCE SERVICE,
R. J. Lishka, and J. H. Parker. 1969, 93p PHS-Pub-1910, PHS-ARS-Study-34

Descriptors: (*Water analysis, *Aluminum), (*Water pollution, Aluminum), Accuracy, Standards, Trace elements.
Identifiers: *Water pollution detection.

Aluminum is present in practically all natural waters and may appear additionally in treated waters as a residual from alum coagulation. There is increasing evidence that very small amounts of aluminum, such as 0.05 mg/l, entering the distribution system can be objectionable. As a result, a recently proposed rapid eriochrome cyanine R (ECR) method for the determination of aluminum in water was tried and appeared to be at least as accurate as the aluminon method and less time consuming and complicated. This study was devised primarily to evaluate the ECR method and compare it with the existing aluminon standard method for aluminum in the presence and absence of interferences (fluorides, polyphosphates, and other metals).

PB-217 977
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
WATER RESOURCES STUDY, FISHING RIVER BASIN, MISSOURI. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER STORAGE FOR MUNICIPAL, INDUSTRIAL, AND QUALITY CONTROL PURPOSES.

Mar 64, 42p

Descriptors: (*Fishing River Basin, *Reservoirs), (*Missouri, *Water resources).
Identifiers: *Clay County (Missouri), *Clinton County (Missouri), *Ray County (Missouri).

The study determines the need for and value of storage for municipal and industrial water supply and streamflow regulation for quality control in Clear Creek, in East Fork Fishing River, and in Fishing River, a tributary of the Missouri River. It covers municipal and industrial water needs and needs for streamflow regulation for quality control during the study period of 1960 to 2060. The study area is the Fishing River drainage basin located in parts of Clay, Clinton and Ray Counties in Missouri. (Author Modified Abstract)

PB-217 978
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION CONTROL. EXCERPTS FROM 'A WATER POLICY FOR THE AMERICAN PEOPLE'.

Jan 51, 28p PHS-Pub-58
Report of the President's Water Resources Policy Commission - 1950.

Descriptors: (*Water pollution, *United States).

The review proved conclusively that (1) even though not all streams are polluted, our major streams are gravely affected and the problem is Nation-wide, and (2) pollution is a factor that already affects or eventually will affect all water resources development, whether it be for flood control, irrigation, hydroelectric power, municipal and industrial use, or recreation. These 11 field surveys covered 4,409 municipalities and 3,413 industrial plants. Of the cities studied, 1,912, or 43 percent, were discharging raw untreated waste into nearby water. The surveys reveal a predominance of pollution in the heavily populated, highly industrialized East.

PB-217 979
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
ARKANSAS-RED RIVER BASINS WATER QUALITY CONSERVATION. APPENDIX. VOLUME I: THE MINERAL POLLUTION PROBLEM AND PROPOSED SOLUTIONS.
Jun 64, 234p

Descriptors: (*Arkansas River Basin, *Water pollution), (*Red River Basin, *Water pollution), Minerals.
Identifiers: *Water quality data.

The report describes the geography, hydrology, and geological features of the Arkansas-Red River basin and identifies the general origins of mineral pollution of the water controls for curbing the pollution are proposed.

PB-217 980
Federal Water Pollution Control Administration, Lawrence, Mass. Merrimack River Project.
REPORT ON POLLUTION OF THE MERRIMACK RIVER AND CERTAIN TRIBUTARIES. PART VI. PEMIGEWASSET RIVER.

Aug 66, 50p
See also Part 2, PB-217 726.

Descriptors: (*Pemigewasset River, *Water pollution), (*Water pollution, *Merrimack River Basin), (*New Hampshire, Water pollution), (*Massachusetts, Water pollution).

Contents: Sources of pollution (general, bacteria, suspended solids, biochemical oxygen demand, sulfite waste liquor); Water uses (municipal use, industrial use, recreation); Effects of pollution on water quality and uses (bacterial pollution, suspended solids, dissolved oxygen, sulfite waste liquor); Future water quality.

PB-217 981
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE EVALUATION OF DEODORANTS FOR USE IN AIRCRAFT CHEMICAL TOILETS.
Final rept.,
L. R. Setter, and C. E. Whitfield. Aug 55, 38p

Descriptors: (*Toilet facilities, *Deodorizing), (*Aircraft equipments, Toilet facilities), Odor control, Corrosion.

The objective of the study was to select deodorants for use in aircraft chemical toilets, and also to develop a group of minimum performance characteristics for deodorant chemicals acceptable to the U. S. Air Force. An air dilution technic obtaining threshold odor values leading to odor control factors was found to be the most satisfactory method for deodorant evaluation. This technic utilized an osmometer developed especially for the purpose. Olfactory anaesthesia and the masking power of deodorants are two other important parameters that can be readily evaluated with the osmometer. (Author Modified Abstract)

PB-217 982
National Air Pollution Control Administration, Washington, D.C.
REPORT FOR CONSULTATION ON THE HARTFORD-SPRINGFIELD INTERSTATE AIR QUALITY CONTROL REGION (CONNECTICUT-MASSACHUSETTS).
Apr 69, 60p

Descriptors: (*Connecticut, *Air pollution), (*Massachusetts, *Air pollution).
Identifiers: *Hartford (Connecticut), *Springfield (Massachusetts), *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of the Hartford-Springfield area covering parts of Connecticut and Massachusetts. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-217 983
Environmental Protection Agency, Athens, Ga. Southeast Water Lab.
SUPPLEMENT TO EFFECTS OF POLLUTION ON WATER QUALITY, PERDIDO RIVER AND BAY, ALABAMA AND FLORIDA.

Feb 71, 31p

Descriptors: (*Perdido River, *Water pollution), (*Paper industry, Water pollution), (*Florida, Water pollution), (*Alabama, Water pollution) Industrial wastes.
Identifiers: *Cantonment (Florida).

During November 1970, personnel from the Southeast Region, Federal Water Quality Administration (FWQA) conducted a 72-hour survey of waste discharges at the St. Regis Integrated Pulp and Paper Mill at Cantonment, Florida. The mill produces 950 tons per day of pulp, of which approximately 280 tons per day are bleached. Approximately 29 million gallons per day (mgd) of liquid wastes are discharged into Elevenmile Creek which flows into the Perdido River. Recommendations are included to abate the existing pollution in Perdido River and Bay, for water quality management and waste abatement program.

PB-217 984
Public Health Service, Kansas City, Mo. Missouri Drainage Basin Office.
NORTH PLATTE RIVER BASIN WATER POLLUTION INVESTIGATION.

Jan 51, 182p
Prepared in cooperation with Bureau of Reclamation, Region 7, and the Water Pollution Control Agencies of the States of Colorado, Nebraska and Wyoming. Library of Congress Catalog Card No. LC-72-614456.

Descriptors: (*Platte River Basin, *Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution), (*Colorado, Water pollution).

The investigation includes: A determination of the extent, types and major sources of pollution; A review of existing laws and pending legislation regarding pollution of public waters in the States of Wyoming, Nebraska, and Colorado; An evaluation of the sanitary quality of irrigation water at present and proposed impoundments, diversion points, and in existing canals; A recommendation regarding minimum stream flows below the reservoirs for public water supplies and for sanitation purposes with present and contemplated pollution; An evaluation of the sanitary quality of water for municipal requirements and other public uses; An estimate of possible benefits to abatement of water pollution problems by reservoir releases; Recommendations and existing plans for pollution abatement.

PB-217 985
Standard Brands Chemical Industries, Inc., Dover, Del.
INVESTIGATION OF AMPHIPATHIC WATER--SOLUBLE POLYMERS AS FLOCCULANTS AND FLOTATION AIDS IN DOMESTIC WASTEWATER TREATMENT,
Julian L. Azorlosa, Logan V. Miller, and Edward Witt. Apr 70, 57p
Contract DI-14-12-430

Descriptors: (*Flocculants, *Ammonium quaternary salts), (*Polymers, Flocculants), (*Sewage treatment, *Flocculating), Polymers, Solubility.

Five amphipathic polymer systems (strong and weak anionic, strong and weak cationic, and nonionic) were prepared by two techniques giving lower and higher molecular weights. The various polymer systems were characterized by Brookfield viscosity and foaming tendency in aqueous solution. These polymers were evaluated for efficiency in removing solids from unsettled raw sewage using three methods: a simple continuous flotation cell, a static pressurized water flotation unit, and a conventional jar test. The nonionic and anionic amphipathic polymers showed little or no flocculating ability; only the cationic types were effective. Qualitatively the strong cationic polymers (dimethylaminoethyl metharcrylate/ethyl bromide quaternary salt as comonomer) were more effective than the weak cationic polymers (dimethylaminoethyl methacrylate/HCl salt as comonomer). Effectiveness increased with increasing % quaternary comonomer.

PB-217 986
Public Health Service, Washington, D.C. Div. of Radiological Health.
RADIATION PROTECTION GUIDES AND DOSE ASSESSMENT.
1964, 170p

Descriptors: (*Radiation protection, Instructions), (*Radiological dosage, *Health physics), (*Ecolo-

gy, Radioactive contaminants), Food chains, Radioactive isotopes, Fresh water biology, Marine biology, Environment, Surveillance.

Contents:
- The problem of surveillance;
- Maximum permissible dietary contamination after the accidental release of radioactive material from a reactor;
- Radiation protection guides;
- Correlation of exposure and dose;
- Some considerations in evaluating radionuclide intake;
- Radionuclides in terrestrial food chains;
- Behavior of radionuclides in food chains - fresh water studies;
- Pollutant radionuclides in the marine environment;
- Representative sampling techniques;
- Report on emergency exposure to external radiation.

PB-217 987
Eastern Environmental Radiation Lab., Montgomery, Ala.
137CS IN WHITETAILED DEER AS RELATED TO VEGETATION AND SOILS OF THE SOUTHEASTERN UNITED STATES,
S. L. Cummings, J. H. Jenkins, L. Bankert, P. H. Bedrosian, and C. R. Porter. 1969, 16p

Descriptors: (*Deer, Radioactive contaminants), (*Southeast United States, *Radioactive contaminants), (*Cesium 137, Southeast United States), Radiobiology, Ecology, Wildlife, Vegetation.

Data are presented for Radioactive Cesium (137Cs), in whitetailed deer and vegetation of the southeastern United States along with information as to the nature of the associated soils. The concentrations of 137Cs in some of the vegetation were of sufficient magnitude to account for the 137Cs concentrations found in the deer. The highest 137Cs concentrations in deer were associated with the Humic-Gley soils along the Atlantic and Gulf Coasts. These soils are predominately sandy in nature and have relatively low fixing capacities. The concentrations of 137Cs in the vegetation grown on the Humic-Gley soils under natural and controlled conditions were greater than from the Gray-Brown Podzolic, and Red-Yellow Podzolic soils. (Author)

PB-217 988
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
THE REUSE OF SEWAGE SLUDGE. AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, (137TH) MEETING.
Dec 70, 17p

Descriptors: (*Sludge disposal, Reviews), Fertilizers, Utilization, Composts, Feeding stuffs.

The report describes the advantages and disadvantages of reusing sludge from sewage treatment processes instead of just burning it. Discussed are land spreading, composting, and hydrolysis to produce an animal food supplement.

PB-217 989
Pacific Northwest Water Lab., Corvallis, Oreg.
AERATED LAGOONS FOR POTATO PROCESSING WASTES,
Kenneth A. Dostal. 1970, 8p
Presented at International Symposium for Waste Treatment Lagoons (2nd). Kansas City, Mo., 23-25 Jun 70.

Descriptors: (*Industrial waste treatment, *Lagoons (Ponds)), (*Food processing, Industrial waste treatment).
Identifiers: *Potatoe processing, *Aeration ponds, *Anaerobic lagoons.

The objectives of the study were to investigate two possible methods of secondary treatment: (1) A surface-aerated aerobic lagoon, and (2) An anaerobic lagoon followed in series by a surface-aerated aerobic lagoon.

PB-217 990
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
THE MOVEMENT AND IMPACT OF PESTICIDES USED IN FOREST MANAGEMENT ON THE AQUATIC ENVIRONMENT AND ECOSYSTEM. VOLUME I.
Pesticide study series no. 7, 19 Jul 71-15 Jan 72, Charles D. Reese, and David L. Becker. Jun 72, 325p CAL-EQ-5025-D-2-Vol-1 EPA-OWP-TS-00-72-07, EPA-OWP-PSS-7
Contract EPA-68-01-0125

Descriptors: (*New York, Pesticides), (*Forestry, *Pest control), (*Aquatic biology, *Pesticides), (*Water pollution, Pesticides), History, DDT, Hydrology, Leaching.
Identifiers: Sevin, Path of pollutants, Gypsy moth.

The report summarizes the findings, conclusions, and recommendations relative to the use of pesticides in the forested regions of New York State, and the resultant impact on the aquatic environment. It is organized on a chronological basis. The scope of this study starts with an historical sketch on the use-development of pesticides in New York State forest management and concludes with indications as to the potential role of pesticides in the future. The fate of pesticides and their impact on the aquatic environment is chronologically summarized by consecutive presentation of what is applied, how is it applied, how it moves from the forest to the aquatic environment and finally, the manifestations of the pesticide within the aquatic environment. (Author Modified Abstract)

PB-217 992
Public Health Service, Washington, D.C.
PROCEEDINGS OF THE 1960 ANNUAL CONFERENCE OF THE SURGEON GENERAL, PUBLIC HEALTH SERVICE AND CHIEF, CHILDREN'S BUREAU WITH STATE AND TERRITORIAL HEALTH OFFICERS HELD IN SAN FRANCISCO, CALIFORNIA ON OCTOBER 26-28, 1960.

1961, 62p PHS-Pub-830

Descriptors: (*Public health, Meetings), Water pollution, Health physics, Poliomyelitis, Immunity, Medical services, Urban areas, Aging (Biology), Children.

Contents:
- Water pollution control;
- Radiological health;
- Environmental health;
- Poliomyelitis control;
- Medical care;
- Metropolitan health planning;
- Public Health Service reorganization;
- Medical assistance for the aged;
- Children's Bureau Services in 1960.

PB-217 993
Environmental Health Center, Cincinnati, Ohio.
EFFECT OF IRRIGATION RUN-OFF ON SURFACE WATER SUPPLIES,
Paul D. Haney, and Thomas W. Bendixen. 14 May 53, 28p

Descriptors: (*Irrigation, *Water pollution), (*Surface water runoff, Water pollution).

Interest in irrigation stems from the facts that (a) irrigation agriculture is the Nation's largest user of fresh water resources and (b) drainage from irrigated areas may have important effects on water quality. The discussion is concerned mainly with chemical water quality changes associated with irrigation use.

PB-217 994
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. PAPER MILLS, EXCEPT BUILDING.
Industrial waste profiles.
Nov 67, 167p FWPCA-IWP-3
Contract DI-14-12-10
See also Volume III, no. 4, PB-218 185. Paper copy available from GPO $2.00, as stock no I67.2:C82V3/No3.

Descriptors: (*Paper industry, *Water pollution), (*Industrial waste treatment, Paper industry), Spent liquors (Pulping), Cost estimates.
Identifiers: *Water pollution control.

The industrial wastewater profile covers the Paper Industry and Integrated pulp and paper mills in the United States as defined by Standard Industrial Classification 2621 (except buildings) of the U. S. Department of Commerce. The principal areas of discussion are: the fundamental manufacturing processes and significant water and gaseous wastes generated by each operation, process water use and reuse, waste quantities and characteristics, waste reduction practices (including both waste treatment and in-plant processing) and their effectiveness, and waste treatment costs. Projections or estimates have been made for the changes, developments, and operating practices that will be prevalent in 1977 for each area of discussion. (Author)

PB-217 995
Federal Water Pollution Control Administration, Metuchen, N.J. Hudson-Champlain and Metropolitan Coastal Comprehensive Water Pollution Control Project.
REPORT ON THE IMMEDIATE WATER POLLUTION CONTROL NEEDS FOR THE INTERSTATE AND INTRASTATE WATERS OF THE NEW JERSEY COASTAL REGION.

Jun 67, 109p
Errata sheet inserted.

Descriptors: (*Water pollution, *New Jersey), Coasts.

The report reviews the water pollution problem in the New Jersey Coastal Region, which extends from Sandy Hook to Cape May and includes those streams draining eastward to the Atlantic Ocean, the various bays and harbors, and the immediate Coastal waters. The Region lies entierly within the State of New Jersey. The discharge of waste from municipalities and numerous other sources degrades water quality and prevents full utilization of this natural resource throughout the Region. The purpose of this report is to delineate those actions which should be undertaken immediately to prevent further degradation of these waters.

PB-217 996
National Field Investigations Center-Denver, Colo.
POLLUTION AFFECTING LAS VEGAS WASH, LAKE MEAD, AND THE LOWER COLORADO RIVER, NEVADA, ARIZONA, CALIFORNIA.
Clean water rept.
Dec 71, 92p

Descriptors: (*Las Vegas Wash, *Water pollution), (*Nevada, Water pollution), (*Lake Mead, Water pollution), Sources.
Identifiers: *Clark County (Nevada).

Direct and indirect discharges of municipal and industrial wastes to Las Vegas Wash from sources in Las Vegas Valley, Nevada, are causing interstate pollution of Lake Mead and the Lower Colorado River which is deleterious to the health or welfare of persons living in Arizona, California and Nevada. This pollution also causes violations of Federal-State water quality standards applicable to Lake Mead and the Colorado River. The report summarizes the technical information document-

ing the interstate pollution and recommends remedial abatement actions.

PB-217 997
Public Health Service, Washington, D.C. Div. of Air Pollution.
THE INTERSTATE AIR POLLUTION STUDY, ST. LOUIS-EAST ST. LOUIS METROPOLITAN AREA,
R. A. Venezia. 11May 65, 23p

Descriptors: (*Missouri, *Air pollution), Illinois.
Identifiers: *Saint Louis (Missouri).

Items included in the study are: air quality levels, air pollution effects, air pollution emission, meteorology and climatology, tracer diffusion, mathematical atmospheric models, economic losses from air pollution, laws and ordinances, and public relations programs.

PB-217 998
Public Health Service, Washington, D.C.
CONFERENCE AT ST. JOSEPH, MISSOURI ON INTERSTATE POLLUTION IN THE MISSOURI RIVER.

11 Jun 57, 48p

Descriptors: (*Missouri River, *Water pollution), (*Missouri, Water pollution), (*Kansas, Water pollution), Proceedings.
Identifiers: *Saint Joseph (Missouri), *Feedlot wastes.

The conference covered interstate pollution of waters of the Missouri River involving the states of Missouri and Kansas, with particular emphasis on discharges caused by St. Joseph, Missouri, and its associated stockyard district.

PB-217 999
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WATER POLLUTION SURVEILLANCE SYSTEM. ANNUAL COMPILATION OF DATA, 1 OCTOBER 1962-30 SEPTEMBER 1963. VOLUME 5: OHIO RIVER BASIN-TENNESSEE RIVER BASIN.

1963, 121p PHS-Pub-663-Rev-63-Vol-5

Descriptors: (*Water pollution, *Ohio River Basin), (*Water pollution, *Tennessee River Basin), Allegheny River, Cumberland River, Kanawha River, Little Miami River, Monongahela River, Wabash River, Clinch River, Ohio River, Tennessee River, Radioactive contaminants, Trace elements, Benthos, Plankton, Stream flow.
Identifiers: *Water quality data.

This is the sixth annual compilation of data from the Public Health Service Water Pollution Surveillance System (formerly the National Water Quality Network). During this, year, the System was increased from 122 to 128 stations. In order to provide data in a form more useful for local or regional water pollution control officials and their staffs, the present compilation is published in 11 separate volumes. The surveillance data reported herein reveal additional findings on pesticides and other organic chemicals in surface waters and on trends in radioactivity and other areas.

PB-218 000
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NATIONAL WATER QUALITY NETWORK ANNUAL COMPILATION OF DATA, OCTOBER 1, 1960-SEPTEMBER 30, 1961.

1961, 552p PHS-Pub-663-1961
A Federal, State and Local Cooperative Report on Water Quality Determinations of Surface Waters at Selected Locations Throughout the United States.

Descriptors: (*Water pollution, *United States), Inventories, Tables (Data), Radioactive contaminants, Plankton, Pesticides, Organic compounds, Trace elements.
Identifiers: *Water quality data.

This is the fourth annual compilation of data from the National Water Quality Network of the Public Health Service. Again the data have revealed some very interesting findings which can be usefully applied to facilitate water quality evaluation. As in each of the years the Network has functioned, an increasing number of State and other non-Federal agencies have taken an active interest in the field of water quality measurement. This is directly attributable to the mounting need for nationwide conservation of water resources. Our own Network was increased from 71 to 93 stations during this data year, and continual expansion is planned toward a goal of 300 stations.

PB-218 001
Environmental Protection Agency, Cincinnati, Ohio. Water Quality Office.
BASIC ENVIRONMENTAL STATISTICS NOTEBOOK.
Training manual.

Mar 71, 210p

Descriptors: (*Statistical tests, *Handbooks), Confidence limits, Sampling theory, Correlation techniques.

In the paper the authors characterize the program action necessary in a two-tailed test of significance by defining and relating the following: (1) test of significance, (2) statistic, (3) null hypothesis, (4) test assumptions, (5) law of random variation for the statistic when H (0) is true, (6) alternative hypothesis, (7) distribution of the statistic when H (+) is true, (8) four possible decisions in a test of significance (9) type-I error, (10) critical values, or value, (11) type-II error, (12) power of the test, (13) rejection region, (14) acceptance region, (15) decision rules, (16) statistical decision, (17) diagram of a two-region, (15), decision rules, (16) statistical decision, (17) diagram of a two-sided test of significance, (18) robustness, (19) sample size, (20) test of significance summarized, (21) example of a two-tailed t-test. The second part describes the program of action in a test of significance when extended to one-sided tests. In addition simple and composite hypotheses are illustrated by several examples. Finally, the relationship between a significance test and confidence limits is exhibited when variations on a two-sided t-test are discussed.

PB-218 002
Environmental Protection Agency, Research Triangle Park, N.C. Inst. for Air Pollution Training.
METEOROLOGICAL INSTRUMENTATION IN AIR POLLUTION,
Ronald C. Hilfiker. 1965, 132p

Descriptors: (*Meteorological instruments, *Air pollution), Manuals.

Contents: Effects of meteorological parameters on air pollution; Meteorological instrumentation at a sampling site; General instrumentation requirements; Wind measurement; Dynamic response of meteorological sensors and recorders; Temperature measurement; Secondary meteorological elements and their measurement; Exposure of meteorological instruments; Data recording; and Data reduction.

PB-218 003
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
A RATIONAL SYSTEM FOR ASSIGNING RESEARCH AND DEVELOPMENT PRIORITIES AT ADVANCED WASTE TREATMENT LABORATORY, CINCINNATI, OHIO.
Sep 70, 70p

Descriptors: (*Sewage treatment, Project planning), Research management.
Identifiers: *Water pollution control.

The report represents a first attempt to supply the staff work for the consideration of priorities for the advanced waste treatment R and D Program in Cincinnati. The priority setting considerations presented are wholly objective. Organizational, political, and personality constraints are excluded. It is assumed that consideration of these more subjective factors will follow the objective analysis and some reordering of priorities will be required. It is shown that existing theory for priority setting is not foolproof and much depends on accurate estimating. The ideas of cost-benefit analysis and planning are useful and if used properly can bring the problem into clearer focus and lead to a rational decision making process.

PB-218 004
Rohm and Haas Co., Philadelphia, Pa. Research Labs.
REMOVAL OF SOLUBLE ORGANIC AND INSOLUBLE ORGANIC AND INORGANIC MATERIALS BY FLOCCULATION,
E. H. Crook, and F. X. Pollio. 1965, 4p
Presented at the International Water Conference Annual Meeting (26th) at Pittsburgh, Pa. on 20-22 October 1965.

Descriptors: (*Sewage treatment, *Flocculating), (*Polyelectrolytes, Flocculating), (*Chemical removal (Sewage treatment), Flocculating).

In the very brief study the removal with polyelectrolytes of both soluble organic and insoluble organic and inorganic materials is considered. Particular attention is given to the use of Primafloc C-7, a polyamine bisulfate salt which permits much greater removals to be attained than do other presently known cationic polyelectrolytes. Emphasis is placed upon the removal of soluble, anionic, organic foulants from aqueous streams. These materials are known to irreversibly foul conventional anion exchange resins. Economical removal of such anionic, organic foulants should increase considerably the useful life of such anion exchange resins.

PB-218 005
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
REGIONAL TEMPERATURE REPORTING NETWORK 1968 FIELD RECONNAISSANCE SURVEY. A FUNCTION OF THE COLUMBIA RIVER THERMAL EFFECTS STUDY,
William Schmidt, and Robert Cleary. Feb 69, 106p
Working Paper-62

Descriptors: (*Columbia River, *Temperature measurement), (*Water pollution, Snake River), (*Willamette River, *Temperature measurement), Electric power plants.
Identifiers: *Thermal pollution.

Potential thermograph sites along the Columbia River from Bonneville Dam to the Canadian Border and the Snake River from the Columbia River confluence to American Falls Dam were investigated during the August 20 to 30, 1968 reconnaissance survey. Temperature cross-sections were taken at some of the critical thermograph sites recommended during the reconnaissance survey. The information obtained from the surveys and summarized here is adequate for locating thermographs in the vicinity of the suggested minimum list sites and for evaluating existing temperature measuring devices for possible incorporation into the network.

PB-218 006
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
INVENTORY OF RESEARCH PROJECTS IN THE PACIFIC NORTHWEST. SUPPLEMENT

NUMBER ONE.

Jan 70, 54p

Descriptors: (*Water pollution, Research).

Contents: Research, development, and demonstration program discription; Project information summaries; Section 5 project awards; Section 6 Project awards; Professional training grants and research fellowships.

PB-218 008
Syracuse Univ., N.Y. Dept. of Chemical Engineering and Metallurgy.
A FINITE DIFFERENCE SOLUTION FOR REVERSE OSMOSIS IN TURBULENT FLOW,
S. Srinivasan, and Chi Tien. 1965, 37p

Descriptors: (*Osmosis, *Turbulent flow), Numerical analysis, Polarization (Charge separation), Diffusion.
Identifiers: *Reverse osmosis, Concentration polarization.

A finite difference solution for reverse osmosis in turbulent flow is presented. The case of a flat duct made of two parallel semi-permeable membranes is considered. The pertinent diffusion equation with the eddy diffusivity based on Deissler's expression is solved using a two-step linearized finite difference scheme, taking into account the nonlinear effect due to the varying water flux across membrane along the axial direction. Numerical results relating concentration polarization, water flux, Sherwood number water recovery ratio and operating conditions are given for a variety of cases. (Author)

PB-218 009
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
STANDARD METHODS FOR THE EXAMINATION OF DAIRY PRODUCTS. PROPOSED CHANGES FOR THE ELEVENTH EDITION.

1960, 7p

Descriptors: (*Dairy products, Chemical analysis), Standards.

The document itemizes the principal changes that have been made in the 11th edition of Standard Methods for the Examination of Dairy Products.

PB-218 012
Public Health Service, Boston, Mass. Div. of Water Supply and Pollution Control.
STATEMENT ON WATER QUALITY MANAGEMENT STATE OF CONNECTICUT AND MASSACHUSETTS PORTION OF HOUSATONIC, CONNECTICUT, AND THAMES RIVER BASINS.
4 Oct 63, 152p
Presented before the Natural Resources and Power Subcommittee of the House Committee on Government Operations, Hartford, Conn. 4 Oct 63.

Descriptors: (*Housatonic River Basin, *Water pollution), (*Connecticut River Basin, *Water pollution), (*Thames River Basin, *Water pollution), (*Connecticut, Water pollution), (*Massachusetts, Water pollution).

The report presents information on the status of water quality management in the Housatonic, Connecticut, and Thames River Basins and their tributaries in the States of Connecticut and Massachusetts.

PB-218 013
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NATIONAL WATER QUALITY NETWORK ANNUAL COMPILATION OF DATA, OCTOBER 1, 1961-SEPTEMBER 30, 1962.
1962, 918p PHS-Pub-663-1962
A Federal, State and Local Cooperative Report on Water Quality Determinations of Surface Waters at Selected Locations Through the United States.

Descriptors: (*Water pollution, *United States), Inventories, Tables (Data), Radioactive contaminants, Plankton, Pesticides, Organic compounds, Trace elements.
Identifiers: *Water quality data.

This is the fifth annual compilation of data from the National Water Quality Network of the Public Health Service. During this year the Network was increased from 93 to 122 stations. The data have revealed interesting findings, particularly with respect to synthetic organic chemicals such as insecticides and pesticides, in our surface waters. Sufficient data have been accumulated to define trends in certain areas, such as radioactivity.

PB-218 014
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
ROSE LAKE TRANSECT STUDY. STATION NO. 153007 SEP 23 AND 24, 1969.
Garry L. Burns. Apr 70, 29p Working Paper-75

Descriptors: (*Coeur d'Alene River, *Water pollution), (*Idaho, Water pollution).
Identifiers: *Water quality data.

The study documents conditions at Station No. 153007 located at river mile 153.4 on the Coeur d Alene River approximately five miles below the confluence of the North and South Forks. Diurnal and spatial variances at the station were observed during a 24-hour period. The objectives of the survey were to determine: What is the optimum sampling point in the stream cross-section, What are the diurnal changes occurring in physical, chemical, biochemical, and bacteriological water quality at the sampling site, What factors influence water quality at the sampling site.

PB-218 015
Oklahoma State Univ., Stillwater.
KINETICS AND MECHANISM IN ACTIVATED SLUDGE PROCESSES.
Progress rept. 1 Sep 62-31 Aug 66,
A. F. Gaudy, Jr. Aug 66, 477p
Grant PHS-WP-00325

Descriptors: (*Activated sludge process, *Reaction kinetics), (*Sewage treatment, Activated sludge process), Biochemical oxygen demand, Metabolism, Microorganism control (Sewage).
Identifiers: Chemical oxygen demand.

The report consists mainly of a compilation of sixteen research papers and publications of work accomplished during the four-year period. Work on mechanism and kinetics of waste water purification was conducted in batch and in completely mixed continuous flow units. It was also necessary to conduct studies on various aspects of research methodology and technique. Reported in detail are investigations on the use of a colorimetric method for determination of COD, the use of COD values of bacterial sludges in waste water purification research, and a statistical study of the spot plate method for viable cell count. A considerable research effort was also made concerning the kinetics and mechanism of exertion of biochemical oxygen demand in both dilute and high energy systems. The effect of sludge concentration on various aspects of biological activity and the mechanism and kinetics of substrate utilization at high biological solids concentration were investigated.

PB-218 062
Public Health Service, Cinncinnati, Ohio.
THE SANITARY CLASSIFICATION OF STREAM WATERS IN CONNECTION WITH POLLUTION ABATEMENT PROGRAMS,
H. W. Streeter. 1939, 10p
Availability: Available in microfiche only.

Descriptors: (*Water pollution, *Classifications).

The purpose of the report was to discuss the particular kinds of laboratory data which have been found to be best adapted to the more practical ends of stream pollution surveys and also to present a suggested general scheme for classifying streams on the basis of their measurable pollution and their general fitness for more common uses.

PB-218 063
National Air Pollution Control Administration, Cincinnati, Ohio.
REPORT FOR CONSULTATION ON THE METROPOLITAN INDIANAPOLIS INTRASTATE AIR QUALITY CONTROL REGION.
May 69, 61p APTD-1190

Descriptors: (*Indiana, *Air pollution).
Identifiers: *Indianapolis (Indiana), *Air quality data.

The Clean Air Act requires the designation of 'air quality control regions' prior to the adoptation of air quality standards and plans for implementation of the standards. A study was thus conducted of The Indianapolis, Indiana, Metropolitan Area. The results of the study are presented in the report. It consists of a description of the region, an emission inventory, meteorology, and urban factors.

PB-218 064
Tulane Univ., New Orleans, La. Dept. of Civil Engineering.
INFILTRATION AND BEDDING STUDY FOR SANITARY SEWERS IN THE GULF COAST AREA.
Progress rept.,
Frank W. Macdonald. 24 Jul 68, 23p
Grant WPD-80-04-68

Descriptors: (*Sewers, *Construction), Infiltration.

The paper is an annual progress report for 1968 of a study concerning sewer beddings in the Gulf Coast area. Progress is reported on the completion of the laboratory model study, field investigations of new sewer systems, and completion of support studies.

PB-218 065
Public Health Service, Washington D.C. Div. of Water Supply and Pollution Control.
THE IDENTIFICATION AND MEASUREMENT OF CHLORINATED HYDROCARBON PESTICIDES IN SURFACE WATERS,
A. W. Breidenbach, J. J. Lichtenberg, C. F. Henke, D. J. Smith, and J. W. Eichelberger, Jr.
Sep 64, 113p PHS-Pub-1241
Errata sheet inserted.

Descriptors: (*Pesticides, *Water analysis), (*Chlorine organic compounds, Water analysis), (*Water pollution, Pesticides), Adsorption, Carbon, Gas chromatography.
Identifiers: *Water pollution detection.

The manual describes the analytical methods which are currently being used in the Public Health Service's Water Pollution Surveillance System in identifying chlorinated hydrocarbon pesticide levels in surface waters. Organic chemicals, as a group, have presented a special challenge to the laboratory because of the many thousands of such chemicals in use and the many complex mixtures of wastes produced in their manufacture. Specific identification and measurement of one class of organics, the chlorinated hydrocarbon pesticides, to a sensitivity of one

microgram per liter or below is of particular concern. The carbon adsorption method, developed over a decade ago, has been effectively employed in pesticide pollution studies.

PB-218 686
Federal Water Pollution Control Administration, Annapolis, Md. Chesapeake Field Station.
PATUXENT RIVER CROSS SECTIONS AND MASS TRAVEL VELOCITIES.
Data rept.

Jul 68, 114p

Descriptors: (*Patuxent River, *Stream flow), (*Tides, Stream flow), Maryland, Shape.

The Chesapeake Field Station, FWPCA, conducted field surveys from 1966 to 1968 to obtain cross-section measurements and mass travel velocities in the Patuxent River and Little Patuxent River. Cross-section surveys were conducted on the tidal river between Jones Point (River Mile 36.8) and River Mile 53.4. Cross-section and dye travel surveys were conducted on selected reaches of the Patuxent River near and downstream from the Baltimore-Washington Parkway, Near Montpelier, Md., (RM 73.4) and on selected reaches of the Little Patuxent River near and downstream from US Route 1, (RM 81.0).

PB-218 988
National Field Investigations Center-Denver, Colo.
POLLUTION AFFECTING SHELLFISH HARVESTING IN GALVESTON BAY, TEXAS.
Clean water rept.
Mar 71, 196p

Descriptors: (*Galveston Bay, *Water pollution), (*Texas, Water pollution), Shellfish, Coliform bacteria, Metals, Oxygen, Dissolved gases.
Identifiers: *Water quality data.

The report summarizes presently available information pertaining to the quality of the Galveston Bay system; evaluates that information with respect to applicable standards, statutes, regulations, and criteria; and recommends a program which will lead to compliance with established water quality uses. The area considered in this report includes all of Galveston Bay, Texas, and its major tributary streams and embayments. Nearly half of Galveston Bay is presently closed for shellfish harvesting due to excessive bacteriological contamination and the proximity to sewage and industrial waste effluents.

PB-218 089
Federal Water Pollution Control Administration, Metuchen, N.J. Raritan Bay Project.
REPORT FOR THE CONFERENCE ON POLLUTION OF RARITAN BAY AND ADJACENT INTERSTATE WATERS. THIRD SESSION. VOLUME III. APPENDICES.

May 67, 152p
See also PB-218 090 and PB-217 844.

Descriptors: (*Raritan Bay, *Water pollution), (*Clams, Raritan Bay), Shellfish, Distribution (Property), Public health.
Identifiers: *Water quality data.

Cases of infectious hepatitis traced to clams harvested from Raritan Bay in 1961 stimulated a cooperative State-Public Health Service study of water and shellfish sanitary quality in the bay. The present report describes the distribution of only two species of clams, the soft shell clam, mya arenaria, and the northern quahaug, mercenaria mercenaria. Quantitative features of population sampling permitted statistical evaluation of the clam resource of Raritan Bay. This information, coupled with the bacteriological information being processed for a separate report, describes the clam-water relationship in Raritan Bay.

PB-218 090
Federal Water Pollution Control Administration, Metuchen, N.J. Raritan Bay Project.
REPORT FOR THE CONFERENCE ON POLLUTION OF RARITAN BAY AND ADJACENT INTERSTATE WATERS. THIRD SESSION. VOLUME II. SOURCES OF POLLUTION.

May 67, 233p
See also PB-217 844 and PB-218 089.

Descriptors: (*Raritan Bay, *Water pollution), Sewage, Heat.
Identifiers: Sewage treatment effluent, Thermal pollution, *Water quality data.

Major pollutional loads to the study waters are presented. Examination of these data indicates the large demand placed upon the assimilative capacity of these waters by the discharge of treated and untreated municipal and industrial wastes. The discharge of additional wastes in adjacent waters increases the magnitude and impact of the direct loads. Contamination by pollutants other than BOD from these same sources is also a significant problem, such as the discharge of unchlorinated and raw municipal wastes. Additional pollution results from the discharge of more than 1.0 billion gallons per day of 'hot' cooling water from power generating plants.

PB-218 169
Public Health Service, Cincinnati, Ohio. Stream Pollution Investigations Station.
THE USE OF CHLORINE FOR THE CORRECTION OF SLUDGE BULKING IN THE ACTIVATED SLUDGE PROCESS,
Russell S. Smith, and W. C. Purdy. 1935, 16p
Availability: Available in microfiche only.

Descriptors: (*Sewage treatment, Microorganism control (Sewage)), (*Fungi, *Microorganism control (Sewage)), (*Chlorination, Microorganism control (Sewage)).

The efficiency of many activated sludge sewage treatment plants is materially affected at times by a diffuse or fluffy condition of the sludge particles, which, in the clarification tank following aeration, results in slow settlement and hence increased volume or 'bulking' of the sludge. Consequently, in aggravated cases large amounts of these sludge solids may be carried over the effluent weirs instead of being removed through the bottom sludge outlets. The report discusses a method of control involving the addition of some material in a concentration toxic to the fungus but not to the other microscopic organisms normal to proper functioning activated sludge.

PB-218 170
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WASTE FACILITIES (1962). REGION IX. ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, WASHINGTON.
1963, 140p PHS-Pub-1065-Vol-9
See also Volume 1, PB-215 834.

Descriptors: (*Alaska, *Sewage treatment), (*Arizona, *Sewage treatment), (*California, *Sewage treatment), (*Hawaii, *Sewage treatment), (*Nevada, *Sewage treatment), (*Oregon, *Sewage treatment), (*Washington (State), *Sewage treatment), Inventories, Tables (Data).

This Inventory contains the latest available data for all sources of municipal pollution which are of significance in water pollution control programs. In the listings, each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Following each State listing is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-218 171
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WASTE FACILITIES (1962). REGION VII. ARKANSAS, LOUISIANA, NEW MEXICO, OKLAHOMA, TEXAS.
1963, 134p PHS-Pub-1065-Vol-7
See also Volume 8, PB-216 108.

Descriptors: (*Arkansas, *Sewage treatment), (*Louisiana, *Sewage treatment), (*New Mexico, *Sewage treatment), (*Oklahoma, *Sewage treatment), (*Texas, *Sewage treatment), Inventories, Tables (Data).

This Inventory contains the latest available data for all sources of municipal pollution which are of significance in water pollution control programs. In the listings, each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Following each State listing is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-218 172
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WASTE FACILITIES (1962). REGION VI. IOWA, KANSAS, MINNESOTA, MISSOURI, NEBRASKA, NORTH DAKOTA, SOUTH DAKOTA.
1963, 203p PHS-Pub-1065-Vol-6
See also Volume 7, PB-218 171.

Descriptors: (*Iowa, *Sewage treatment), (*Kansas, *Sewage treatment), (*Minnesota, *Sewage treatment), (*Missouri, *Sewage treatment), (*Nebraska, *Sewage treatment), (*North Dakota, *Sewage treatment), (*South Dakota, *Sewage treatment), Inventories, Tables (Data).

This Inventory contains the latest available data for all sources of municipal pollution which are of significance in water pollution control programs. In the listings, each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Following each State listing is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-218 173
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WASTE FACILITIES (1962). REGION II. DELAWARE, NEW JERSEY, NEW YORK, PENNSYLVANIA.
1963, 207p PHS-Pub-1065-Vol-2
See also Volume 3, PB-218 174.

Descriptors: (*Delaware, *Sewage treatment), (*New Jersey, *Sewage treatment), (*New York, *Sewage treatment), (*Pennsylvania, *Sewage treatment), Inventories, Tables (Data).

This Inventory contains the latest available data for all sources of municipal pollution which are of significance in water pollution control programs. In the listings, each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Following each State listing is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-218 174
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WASTE FACILITIES (1962). REGION III. DISTRICT OF

COLUMBIA, KENTUCKY, MARYLAND, NORTH CAROLINA, VIRGINIA, WEST VIRGINIA, PUERTO RICO.
1963, 141p PHS-Pub-1065-Vol-3
See also Volume 4, PB-218 175

Descriptors: (*District of Columbia, *Sewage treatment), (*Kentucky, *Sewage treatment), (*Maryland, *Sewage treatment), (*North Carolina, *Sewage treatment), (*Virginia, *Sewage treatment), (*West Virginia, *Sewage treatment), (*Puerto Rico, *Sewage treatment), Inventories, Tables (Data).

This Inventory contains the latest available data for all sources of municipal pollution which are of significance in water pollution control programs. In the listings, each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Following each State listing is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-218 175
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WASTE FACILITIES (1962). REGION IV. ALABAMA, FLORIDA, GEORGIA, MISSISSIPPI, SOUTH CAROLINA, TENNESSEE.
1963, 139p PHS-Pub-1065-Vol-4
See also Volume 5, PB-218 176.

Descriptors: (*Alabama, *Sewage treatment), (*Florida, *Sewage treatment), (*Georgia, *Sewage treatment), (*Mississippi, *Sewage treatment), (*South Carolina, *Sewage treatment), (*Tennessee, *Sewage treatment), Inventories, Tables (Data).

This Inventory contains the latest available data for all sources of municipal pollution which are of significance in water pollution control programs. In the listings, each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Following each State listing is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-218 176
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WASTE FACILITIES (1962). REGION V. ILLINOIS, INDIANA, MICHIGAN, OHIO, WISCONSIN.
1963, 197p PHS-Pub-1065-Vol-5
See also Volume 6, PB-218 172.

Descriptors: (*Illinois, *Sewage treatment), (*Indiana, *Sewage treatment), (*Michigan, *Sewage treatment), (*Ohio, *Sewage treatment), (*Wisconsin, *Sewage treatment), Inventories, Tables (Data).

This Inventory contains the latest available data for all sources of municipal pollution which are of significance in water pollution control programs. In the listings, each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Following each State listing is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries, together with the names of all entries which are served by the particular facility.

PB-218 177
Public Health Service, Washington, D.C.
SCIENTIFIC STATESMANSHIP IN AIR POLLUTION CONTROL,
Barry Commoner. 1964, 13p PHS-Pub-1239
Presented at the National Conference on Air Pollution, Dec 62.

Descriptors: (*Air pollution, Scientists).

The report is concerned with finding ways to free the air of its growing burden of pollution. It discusses the role of the scientist.

PB-218 178
Federal Water Pollution Control Administration, Washington, D. C.
THE COST OF CLEAN WATER. VOLUME I. SUMMARY REPORT.
10 Jan 68, 48p
See also Volume 2, PB-218 182.

Descriptors: (*Sewage treatment, *Economic analysis), (*Water pollution, *Economic analysis), (*Industrial waste treatment, *Economic analysis), Cost estimates.
Identifiers: *Water pollution economics.

The report presents initial estimates of the national requirements for and the cost of treating municipal, industrial, and other effluent during FY 1969-1973 to meet water quality standards established under the Federal Water Pollution Control Act, and comparable levels for intrastate and coastal waters.

PB-218 179
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. INDUSTRIAL WASTE PROFILES NO. 9. DAIRIES.

Sep 67, 168p FWPCA-IWP-9
Paper copy available from GPO $1.00 as stock no, I67.2:382/V3/NO9. See also volume 3 no. 1, PB-218 184.

Descriptors: (*Food processing, *Water pollution), (*Industrial wastes, *Dairy products), Economic analysis, Cost analysis, Industrial wastes, Milk.
Identifiers: *Dairy industry, *Water pollution economics.

The profile is a qualitative and quantitative description of wastes and wastewater generated in the Dairy Industry. The industry is examined in its important major subdivisions as follows: Creamery butter; Cheese, natural and processed; Condensed and evaporated milk; Ice cream and frozen desserts; Fluid milk; The waste and wastewater estimates are developed from actual plant operating experience, and are correlated with manufacturing processes and are augmented with waste reduction and removal cost estimates. Projections of waste and wastewater for future years are developed in detail.

PB-218 180
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. INDUSTRIAL WASTE PROFILES NO. 7. LEATHER TANNING AND FINISHING.

30 Jun 67, 72p FWPCA-IWP-7
Paper copy Available from GPO $.65, as stock no. I67.2:382/V3/NO7. See also volume 3, no. 6, PB-218 181.

Descriptors: (*Leather industry, *Water pollution), (*Industrial wastes, Leather industry), Economic analysis, Cost estimates, Industrial waste treatment.
Identifiers: *Water pollution economics.

The report evaluates the total relationship of products produced, waste pollution load, economics involved, and long term environmental quality factors of the leather tanning and finishing industries.

PB-218 181
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. INDUSTRIAL WASTE PROFILES NO. 6. CANNED AND FROZEN FRUITS AND VEGETABLES.

30 Jun 67, 125p FWPCA-IWP-6
Paper copy available from GPO$1.25, as stock no. 167.2:382/V3/NO6. See also Volume 3, No. 7, PB-218 180.

Descriptors: (*Water pollution, *Food processing), (*Industrial wastes, Food processing), (*Canneries, Industrial wastes), Economic analysis, Cost estimates, Industrial waste treatment.
Identifiers: *Water pollution economics, *Fruit processing, *Vegetable processing.

The report evaluates the total relationship of products produced, waste pollution load, economics involved, and long term environmental quality factors of the canned and frozen fruit and vegetable industries.

PB-218 182
Federal Water Pollution Control Administration, Washington, D. C.
THE COST OF CLEAN WATER. VOLUME II. DETAILED ANALYSIS.

10 Jan 68, 253p
See also report dated 10 Jan 68, PB-218 178.

Descriptors: (*Water pollution, *Economic analysis), (*Sewage treatment, *Economic analysis), (*Industrial waste treatment, *Economic analysis), Cost estimates.
Identifiers: *Water pollution economics.

The report estimates the costs of providing waste treatment to the total urban population of the U. S. by 1973 (162.6 million) at appropriate treatment levels to comply with water quality standards. In order to meet the standards by 1973, it is estimated that 90% of the urban population will require secondary treatment facilities and 10% primary treatment facilities. The urban population in 1973 will be 75% of the total U. S. population. Currently, only 55% of the urban population is served by adequate waste treatment facilities.

PB-218 183
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. INDUSTRIAL WASTE PROFILES NO. 2. MOTOR VEHICLES AND PARTS.

24 Nov 67, 125p FWPCA-IWP-2
Paper copy available from GPO $.70 as stock no. I67.2:382/V3/No2. See also volume 3 no. 4, PB-218 185.

Descriptors: (*Automotive industry, *Water pollution), (*Industrial wastes, Automotive industry), Cost estimates, Industrial waste treatment, Economic analysis.
Identifiers: *Water pollution economics.

The report develops a pollution profile for the Motor Vehicle and Motor Vehicle Equipment Industry. Projected waste loads and treatment trends have been provided. The replacement values for the existing treatment facilities as well as the anticipated costs for future treatment practices have been included in terms of both capital and operating costs. Existing and projected waste loads and

treatment practices have been established for that part of the Motor Vehicle Industry that can be characterized as stamping plants, body and final assembly operations only.

PB-218 184
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. INDUSTRIAL WASTE PROFILES NO. 1. BLAST FURNACE AND STEEL MILLS.

28 Sep 67, 102p FWPCA-IWP-1
Paper copy available from GPO $0.60 as stock no. I67.2:382/V3/NO1. See also volume 3 No. 2, PB-218 183.

Descriptors: (*Iron and steel industry, *Water pollution), (*Steel making, *Industrial wastes), Steel plants, Blast furnaces, Cost estimates, Industrial waste treatment, Economic analysis.
Identifiers: *Water pollution economics.

The profile study provides the Federal Water Pollution Control Administration with comprehensive information on the waterborne wastes of the blast furnace and steel mill industry - SIC 3312. This industry includes establishments primarily engaged in manufacturing hot metal, pig iron, silvery pig iron, and ferroalloys from iron ore and iron and steel scrap; converting pig iron, scrap iron, and scrap steel into steel; and in hot-rolling steel into basic shapes such as plates, sheets, strips, rods, bars, and tubing. Merchant blast furnaces and by-product or beehive coke ovens are also included in this industry. (Author Modified Abstract)

PB-218 185
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. INDUSTRIAL WASTE PROFILES NO. 4. TEXTILE MILL PRODUCTS.

30 Jun 67, 147p FWPCA-IWP-4
Paper copy available from GPO $1.25, as stock no. I67.2:382/V3/NO4. See also Volume 3 no. 1, PB-218 184.

Descriptors: (*Textile industry, *Water pollution), (*Industrial wastes, Textile industry), Economic analysis, Cost estimates, Industrial waste treatment.
Identifiers: *Water pollution economics.

The report evaluates the total relationship of products produced, waste pollution load, economics involved, and long term environmental quality factors of the textile industry. This Industrial Waste Profile is divided into three major sections. The first section surveys the Wool Textile Weaving and Finishing Industry; the second section, the Cotton textile Finishing Industry; and the third section, the Synthetic textile Finishing Industry.

PB-218 187
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
AN INDUSTRIAL WASTE GUIDE TO THE SYNTHETIC TEXTILE INDUSTRY.

1965, 27p PHS-Pub-1320

Descriptors: (*Textile industry, *Industrial waste treatment), (*Water pollution, Textile industry), Industrial wastes, Synthetic fibers.

Contents: General problem; Description of process, (Dyeing, Blending, Carding, and Spinning, Winding, Warping, and Slashing, Weaving, Dyeing and Finishing); Sources, Characteristics and pollution effects of process wastes; Survey methods; Remedial methods; Treatment methods.

PB-218 188
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
AN INDUSTRIAL WASTE GUIDE TO THE MEAT INDUSTRY.
1965, 20p PHS-Pub-386

Descriptors: (*Food processing, *Industrial waste treatment), (*Water pollution, Food processing), Industrial wastes.
Identifiers: *Slaughtering house wastes.

Contents: Description of process; Raw materials and products; Origin of wastewater (Slaughterhouses, Packing Plants, Stockyards, Processing Plants); Combined wastewater flow and characteristics; Pollution effects; Remedial measures (Plant Practices, Treatment, Trickling Filters, Irrigation, Anaerobic Contact, Stabilization Ponds).

PB-218 189
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
AN INDUSTRIAL WASTE GUIDE TO THE MILK PROCESSING INDUSTRY.

1959, 26p PHS-Pub-298-Rev-59

Descriptors: (*Milk, Food processing), (*Food processing, *Industrial waste treatment).
Identifiers: *Water pollution control.

The publication represents the combined efforts of dairy waste sanitary engineers, dairy waste technologists, and others of the dairy industry to develop a practical guide for milk plant management and operating personnel. The subject of milk plant wastes, with methods of recovery and treatment, has been extensively studied for years by State and Federal agencies, experiment stations, sanitary engineers, and other individuals. For the purpose of this guide results as are available have been used to demonstrate the various types of treatment. This publication emphasizes the appreciable reduction of dairy waste which can be accomplished through a waste-prevention program that can be carried out within the processing plant. Practical procedures are described. Some performance data are presented which will serve to emphasize to milk plant supervisory personnel the value of waste prevention methods in reducting total waste treatment costs.

PB-218 190
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WATER FACILITIES (1963). REGION I. CONNECTICUT, MAINE, MASSACHUSETTS, NEW HAMPSHIRE, RHODE ISLAND, AND VERMONT.

1964, 82p PHS-Pub-775-Rev-Vol-1

Descriptors: (*Connecticut, *Water supply), (*Maine, *Water supply), (*Massachusetts, *Water supply), (*New Hampshire, *Water supply), (*Rhode Island, *Water supply), (*Vermont, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1963. The listing includes all facilities serving places having a population of 100 or more which have been reported by the responsible State agencies. In a few States, places smaller than this size have been reported. The listing is alphabetic by name of facility or place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 191
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WATER FACILITIES (1963). REGION II. DELAWARE, NEW JERSEY, NEW YORK, AND PENNSYLVANIA.
1964, 177p PHS-Pub-775-Rev-Vol-2

Descriptors: (*Delaware, *Water supply), (*New Jersey, *Water supply), (*New York, *Water supply), (*Pennsylvania, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1963. The listing includes all facilities serving places having a population of 100 or more which have been reported by the responsible State agencies. In a few States, places smaller than this size have been reported. The listing is alphabetic by name of facility or place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 192
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WATER FACILITIES (1963). REGION III. DISTRICT OF COLUMBIS, KENTUCKY, MARYLAND, NORTH CAROLINA, VIRGINIA, WEST VIRGINIA, PUERTO RICO, AND VIRGIN ISLANDS.
1964, 115p PHS-Pub-775-Rev-Vol-3

Descriptors: (*District of Columbia, *Water supply), (*Kentucky, *Water supply), (*Maryland, *Water supply), (*North Carolina, *Water supply), (*Virginia, *Water supply), (*West Virginia, *Water supply), (*Puerto Rico, *Water supply), (*Virgin Islands, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1963. The listing includes all facilities serving places having a population of 100 or more which have been reported by the responsible State agencies. In a few States, places smaller than this size have been reported. The listing is alphabetic by name of facility or place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 193
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WATER FACILITIES (1963). REGION IV. ALABAMA, FLORIDA, GEORGIA, MISSISSIPPI, SOUTH CAROLINA, AND TENNESSEE.
1964, 102p PHS-Pub-775-Rev-Vol-4

Descriptors: (*Alabama, *Water supply), (*Florida, *Water supply), (*Georgia, *Water supply), (*Mississippi, *Water supply), (*South Carolina, *Water supply), (*Tennessee, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1963. The listing includes all facilities serving places having a population of 100 or more which have been reported by the responsible State agencies. In a few States, places smaller than this size have been reported. The listing is alphabetic by name of facility or place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 194
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WATER FACILITIES (1963). REGION V. ILLINOIS, INDIANA, MICHIGAN, OHIO, AND WISCONSIN.
1964, 152p PHS-Pub-775-Rev-Vol-5

Descriptors: (*Illinois, *Water supply), (*Indiana, *Water supply), (*Michigan, *Water supply), (*Ohio, *Water supply), (*Wisconsin, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1963. The listing includes all facilities serving places having a population of 100 or more which have been reported by the responsible State agencies. In a few States, places smaller than this size have been reported. The listing is alphabetic by name of facility or place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 195
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WATER FACILITIES (1963). REGION VI. IOWA, KANSAS, MINNESOTA, MISSOURI, NEBRASKA, NORTH DAKOTA, AND SOUTH DAKOTA.
1964, 145p PHS-Pub-775-Rev-Vol-6

Descriptors: (*Iowa, *Water supply), (*Kansas, *Water supply), (*Minnesota, *Water supply), (*Missouri, *Water supply), (*Nebraska, *Water supply), (*North Dakota, *Water supply), (*South Dakota, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1963. The listing includes all facilities serving places having a population of 100 or more which have been reported by the responsible State agencies. In a few States, places smaller than this size have been reported. The listing is alphabetic by name of facility or place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 196
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WATER FACILITIES (1963). REGION VII. ARKANSAS, LOUISIANA, NEW MEXICO, OKLAHOMA, AND TEXAS.
1964, 118p PHS-Pub-775-Rev-Vol-7

Descriptors: (*Arkansas, *Water supply), (*Louisiana, *Water supply), (*New Mexico, *Water supply), (*Oklahoma, *Water supply), (*Texas, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1963. The listing includes all facilities serving places having a population of 100 or more which have been reported by the responsible State agencies. In a few States, places smaller than this size have been reported. The listing is alphabetic by name of facility or place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 197
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WATER FACILITIES (1963). VOLUME VIII. COLORADO, IDAHO, MONTANA, UTAH, AND WYOMING.
1964, 67p PHS-Pub-775-Rev-Vol-8

Descriptors: (*Colorado, *Water supply), (*Idaho, *Water supply), (*Montana, *Water supply), (*Utah, *Water supply), (*Wyoming, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1963. The listing includes all facilities serving places having a population of 100 or more which have been reported by the responsible State agencies. In a few States, places smaller than this size have been reported. The listing is alphabetic by name of facility or place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 198
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WATER FACILITIES (1963). REGION IX. ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, AND WASHINGTON.
1964, 157p PHS-Pub-775-Rev-Vol-9

Descriptors: (*Alaska, *Water supply), (*Arizona, *Water supply), (*California, *Water supply), (*Hawaii, *Water supply), (*Nevada, *Water supply), (*Oregon, *Water supply), (*Washington (State), *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1963. The listing includes all facilities serving places having a population of 100 or more which have been reported by the responsible State agencies. In a few States, places smaller than this size have been reported. The listing is alphabetic by name of facility or place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 199
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. VOL. 7. REGION VII - ARKANSAS, LOUISIANA, NEW MEXICO, OKLAHOMA, TEXAS.
1960, 111p PHS-Pub-775-Vol-7

Descriptors: (*Arkansas, *Water supply), (*Louisiana, *Water supply), (*New Mexico, *Water supply), (*Oklahoma, *Water supply), (*Texas, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. The listing is alphabetic by name of place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 200
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. VOLUME 6. REGION VI - IOWA, KANSAS, MINNESOTA, MISSOURI, NEBRASKA, NORTH DAKOTA, SOUTH DAKOTA.
1960, 136p PHS-Pub-775-Vol-6

Descriptors: (*Iowa, *Water supply), (*Kansas, *Water supply), (*Minnesota, *Water supply), (*Missouri, *Water supply), (*Nebraska, *Water supply), (*North Dakota, *Water supply), (*South Dakota, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more. The listing is alphabetic by name of place wtihin the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 201
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. VOLUME 4. REGION IV - ALABAMA, FLORIDA, GEORGIA, MISSISSIPPI, SOUTH CAROLINA, TENNESSEE.
1960, 105p PHS-Pub-775-Vol-4

Descriptors: (*Alabama, *Water supply), (*Florida, *Water supply), (*Georgia, *Water supply), (*Mississippi, *Water supply), (*South Carolina, *Water supply), (*Tennessee, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. The listing is alphabetic by name of place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 202
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. VOLUME 5. REGION V - ILLINOIS, INDIANA, MICHIGAN, OHIO, WISCONSIN.
1960, 136p PHS-Pub-775-Vol-5

Descriptors: (*Illinois, *Water supply), (*Indiana, *Water supply), (*Michigan, *Water supply), (*Ohio, *Water supply), (*Wisconsin, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. The listing is alphabetic by name of place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 203
Public Health Service, Washington, D.C. Div. of Sanitation.
MANUAL OF RECOMMENDED PRACTICE FOR SANITARY CONTROL OF THE SHELLFISH INDUSTRY.
1964, 50p PHS-Pub-33

Previously announced as PHS-BULL-295. Paper copy available from GPO $0.20 as 1701-0177.

Descriptors: (*Shellfish, *Food sanitation), Manuals, Seafood.

The manual includes a list of control measures for the sanitary quality of shellfish to be shipped in interstate Commerce. In carrying out this cooperative control, the State, the industry, and the Public Health Service are each responsible for certain procedures.

PB-218 204
Public Health Service, Washington, D. C.
PUBLIC HEALTH SERVICE DRINKING WATER STANDARDS.
1962, 70p PHS-Pub-956-Rev-62
Paper copy available from GPO $0.30 as FS2.6/2:W29/962.

Descriptors: (*Water supply, Standards), (*Potable water, *Standards), Public health.

Domestic water supplies should protect the health and promote the well-being of individuals and the community. This report on the revision of the 1946 edition of the Public Health Service Drinking Water Standards recommends minimum requirements for reaching this goal.

PB-218 205
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
MUNICIPAL WATER FACILITIES INVENTORY AS OF JANUARY 1, 1958. VOLUME 3. REGION III - DISTRICT OF COLUMBIA, KENTUCKY, MARYLAND, NORTH CAROLINA, VIRGINIA, WEST VIRGINIA, PUERTO RICO, VIRGIN ISLANDS.
1960, 116p PHS-Pub-775-Vol-3

Descriptors: (*District of Columbia, *Water supply), (*Kentucky, *Water supply), (*Maryland, *Water supply), (*North Carolina, *Water supply), (*Virginia, *Water supply), (*West Virginia, *Water supply), (*Puerto Rico, *Water supply), (*Virgin Islands, *Water supply), Inventories, Tables (Data).

This volume is one of nine which, taken together, comprise an inventory of public water supply facilities in the United States as of January 1, 1958. The listing includes all facilities serving places having a 1950 population of 100 or more which have been reported by the respective State Departments of Health. The listing is alphabetic by name of place within the State. The purpose of this inventory is to furnish up-to-date information on all water facilities for the use of industries and other private agencies and all levels of government.

PB-218 207
Federal Water Quality Administration, Washington, D.C.
NATIONAL PLAN AND STRATEGY FOR WATER QUALITY. PROGRAM SUMMARY.
Clean water rept.
Nov 70, 139p FWQA-14-12-910-10/70

Descriptors: (*Water pollution, *Strategies), (*Government policies, Water pollution), National government.

The Program Summary presents the Federal Water Quality Administration's National Plan and Strategy for achieving defined water quality objectives during the decade of the 1970's. This summary revises and updates the preliminary draft Program Memorandum of 12 August 1970.

PB-218 208
Public Health Service, Kansas City, Mo. Region VI.
MISSOURI RIVER WATER QUALITY SURVEY 1955-1956. CHARTS AND PRELIMINARY NOTES.
1956, 64p

Descriptors: (*Missouri River, *Water pollution), Coliform bacteria.
Identifiers: *Water quality data.

The accompanying figures depicting various considerations of coliform-type bacteria concentration in the Missouri River are based upon data furnished through the cooperation of water treatment plant operators at Omaha, Nebraska; Council Bluffs, Iowa; St. Joseph, Missouri; Kansas City, Kansas; Lexington, Missouri; and Boonville, Missouri. Operators at Omaha, Council Bluffs, and Kansas City, Kansas, made available their routine daily analysis results. Personnel at the Missouri plants began daily analyses in February 1955 at the special request of the Missouri Division of Health and Public Health Service. Collection of data at the six localities is continuing. This report concerns the period February 1955 to December 1956.

PB-218 209
Iowa Engineering Experiment Station, Ames.
DESIGN REQUIREMENTS FOR MUNICIPAL DIATOMITE FILTERS.
Progress rept. no. 3, 1 Mar 64-30 Nov 65,
Paul E. Morgan, and E. Robert Baumann. 15 Dec 65, 263p
Grant PHS-WP-00196

Descriptors: (*Diatomaceous earth, *Filter aids), (*Sewage filtration, Filter aids), (*Filtration, Filter aids), Numerical analysis, Design, Computer programs, Mathematical models.

The study was undertaken to determine the characteristics of municipal applications in which diatomite filters may be used successfully, to study the effect of various variables on filtration economy and effectiveness, and to outline a procedure for designing a plant to operate with maximum economy. The topics discussed include: Permeability of diatomite filter cakes containing various clay minerals; Coatings for filter media; Diatomite filtration equations for flat and cylindrical septa; Prediction of diatomite filter cake resistance; Optimum design and operation of diatomite filtration plants; and User manual for program for optimization of plant operation.

PB-218 211
International Joint Commission-United States and Canada.
REPORT OF THE INTERNATIONAL JOINT COMMISSION, UNITED STATES AND CANADA, ON THE POLLUTION OF BOUNDARY WATERS.
1951, 328p

Descriptors: (*Lake Superior, *Water pollution), (*Lake Huron, *Water pollution), (*Lake Erie, *Water pollution), (*Lake Ontario, *Water pollution), United States, Canada.
Identifiers: *Water quality data.

In order to permit a more accurate evaluation of the nature and extent of pollution, its effects and the remedial measures necessary, the Commission, in the course of the investigation, adopted the following statement of objectives for boundary waters quality control which was developed by the technical advisers: 'The term 'boundary waters' as herin used shall include the waters defined in the references to the International Joint Commission dated April 1, 1946, October 2 and 3, 1946, and April 2, 1948 and are as follows: St. Clair River, Lake St. Clair, the Detroit River, St. Marys River from Lake Superior to Lake Huron, and Niagara River from Lake Erie to Lake Ontario. These objectives are for the boundary waters in general, and it is anticipated that in certain specific instances, influenced by local conditions, more stringent requirements may be found necessary.

PB-218 222
Federal Water Pollution Control Administration, Washington, D. C.
THE COST OF CLEAN WATER. VOLUME III. PETROLEUM REFINING.
Industrial Waste Profiles.

Nov 67, 197p FWPCA-IWP-5
Paper copy available from GPO $1.50 as I 67.2:382/V3/No.5.

Descriptors: (*Water pollution, *Refineries), (*Petroleum refining, Water pollution), (*Cost analysis, Water pollution), (*Industrial waste treatment, Refineries).
Identifiers: *Water pollution economics.

The industrial wastewater profile covers the Petroleum Refinery industry in the United States as defined by Standard Industrial Classification 2911 of the U. S. Department of Commerce. It does not cover the production of crude oil or natural gas from wells or the natural gasoline and other operations associated with such production. Transportation of petroleum products is covered only to the extent that it is a part of refinery pollution control, such as treatment of ballast water. The principal areas of discussion are: the fundamental manufacturing processes and their patterns of use, water use and reuse, waste quantities and characteristics, waste reduction practices (including both waste treatment and in-plant processing) and their effectiveness, and waste treatment costs. In each area of discussion trends have been projected to or estimates made for the situation expected in 1977.

PB-218 223
Public Health Service, Cincinnati, Ohio. Office of Stream Sanitation.
EXISTING POLLUTION IN THE OHIO RIVER AND THE EFFECT OF CHANGES IN STREAM DISCHARGE BY THE PROPOSED FLOOD CONTROL PROGRAM ON THE OHIO RIVER WATERSHED.

1 Dec 37, 105p

Descriptors: (*Ohio River, *Water pollution), (*Flood control, Ohio River), Flushing, Stream flow.
Identifiers: Low water flow.

Effect of proposed flood control program in the Ohio Valley on existing river pollution. Included are reviews such as: Summary of existing pollutional conditions in the Ohio River, probable effect on existing pollution of flood control program, effects of increased low water flows in Pittsburgh area, effects of increased low water flow in tributaries polluted with acid drainage, effect of increased low water flows on conditions above and below communities outside zone of acid drainage, effect of increased low water flow on tributary streams not affected by acid drainage, effect of increased low water flow on the pollution at water works intakes.

PB-218 224
Federal Water Pollution Control Administration, Washington, D.C.
THE COST OF CLEAN WATER. VOLUME III. PAPER MILLS.
Industrial waste profiles.

Nov 67, 190p FWPCA-IWP-3
Paper copy available from GPO $2.00 as I 67.2:382/v3/no.3.

Descriptors: (*Water pollution, *Paper industry), (*Cost analysis, Water pollution), (*Industrial waste treatment, Paper industry).
Identifiers: *Water pollution economics.

The industrial wastewater profile covers the Paper Industry and Integrated pulp and paper mills in the United States as defined by Standard Industrial Classification 2621 (except buildings) of the U. S.

Department of Commerce. The principal areas of discussion are: the fundamental manufacturing processes and significant water and gaseous waste generated by each operation, process water use and reuse, waste quantities and characteristics, waste reduction practices (including both waste treatment and in-plant processing) and their effectiveness, and waste treatment costs. Projections of estimates have been made for the changes, developments, and operating practices that will be prevalent in 1977 for each area of discussion.

PB-218 225
Public Health Service, Washington, D.C. Div. of Air Pollution.
GUIDE TO RESEARCH IN AIR POLLUTION: PROJECTS ACTIVE IN CALENDAR YEAR 1966.
6th ed.

1966, 85P PHS-Pub-981-1966
See also Edition no. 7 dated Apr 70, PB-192 220.

Descriptors: (*Air pollution, Research).

The Guide is divided into four sections, the first summarizing the status of air pollution research as a whole, the second listing individual projects under investigation during 1966, and the third and fourth sections providing indexes to these projects by subject and by investigator. The introductory information of each section explains the arrangement of information presented therein.

PB-218 226
Public Health Service, Washington, D. C. Div. of Sanitary Engineering Services.
MANUAL OF SEPTIC-TANK PRACTICE. DEVELOPED IN COOPERATION WITH THE JOINT COMMITTEE ON RURAL SANITATION.
1 Aug 59, 96p PHS-Pub-526
Addendum to part I inserted.

Descriptors: (*Septic tanks, *Manuals).

The Manual on septic tank practices has been prepared for use as a guide by health agencies, building officials, installers, and others, to meet the need for an authoritative treatise on the subject.

PB-218 227
Public Health Service, Washington, D.C.
REPORT OF THE COMMITTEE ON ENVIRONMENTAL HEALTH PROBLEMS TO THE SURGEON GENERAL.
1962, 286p PHS-Pub-908

Descriptors: (*Public health, *Environments), Biomathematics, Statistical analysis, Manpower, Air pollution, Water pollution, Health physics, Food, Industrial hygiene, Environmental engineering, Pharmacology, Toxicology, Physiology, Biochemistry.

Contents:
- General background: The effort needed in environmental health;
- Resources required for the needed effort in environmental health;
- Problems in environmental health;
- Manpower resources and training;
- Applied mathematics and statistics;
- Pharmacology, toxicology, physiology, and biochemistry;
- Analytical methods and instrumentation;
- Air pollution;
- Environmental engineering;
- Milk and food;
- Occupational health;
- Radiological health;
- Water supply and pollution control.

PB-218 228
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
SELECTED BIBLIOGRAPHY OF PUBLICATIONS ON INDUSTRIAL WASTES RELATING TO FISH AND OYSTERS.
Public Health bibliography series,
William Marcus Ingram, and Peter Doudoroff. Jun 53, 31p PHS-Pub-270, PHS-BS-10

Descriptors: (*Water pollution, *Bibliographies), (*Fishes, Water pollution), (*Oysters, Water pollution).
Identifiers: *Water pollution effects (Animals).

Primarily, this bibliography presents selected references that report the effects of industrial wastes on fish and oysters in their natural habitats. Some references pertaining to bioassay experiments showing the effects of industrial effluents on fish and oysters also are included.

PB-218 250
Public Health Service, Washington, D. C.
CLEAN WATER FOR THE PACIFIC NORTHWEST.

1952, 7p PHS-Pub-201

Descriptors: (*Pacific Northwest, Water pollution), (*Columbia River Basin, *Water pollution).

The report presents a brief overview of water pollution problems in the Columbia River Basin and adjacent areas.

PB-218 251
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
STATISTICAL SUMMARY OF 1962 INVENTORY - MUNICIPAL WASTE FACILITIES IN THE UNITED STATES.
Andrew C. Glass, and Kenneth H. Jenkins. 1964, 45p PHS-Pub-1165

Descriptors: (*Sewage treatment, *United States), Inventories, Tables (Data).

The report presents a summary and analysis of data on sewage disposal facilities in the United States, which are published in detail in the 1962 Inventory of Municipal Waste Facilities. The data are produced in 10 tables. National summaries are given for sewer systems, sewage treatment, and disposal. Details by States, population size groups, and major drainage basins are given in separate tables. The data in the given tables are brought together for a quick summary of nationwide conditions.

PB-218 252
National Center for Urban and Industrial Health, Cincinnati, Ohio.
PROCEEDINGS: THE SURGEON GENERAL'S CONFERENCE ON SOLID WASTE MANAGEMENT FOR METROPOLITAN WASHINGTON, 19-20 JULY 1967,
Leo Weaver. Nov 67, 191p PHS-Pub-1729-2
Library of Congress Catalog Card no. 67-62888.

Descriptors: (*Waste disposal, *District of Columbia), Air pollution, Materials handling, Automobiles, Hauling, Earth fills, Refuse, Combustion, Composts, Utilization, Regional planning, Management planning.
Identifiers: *Solid waste disposal, Sanitary landfills, Pyrolysis incineration, Waste recycling, *Kenilworth sanitary landfill.

Contents:
- Solid waste disposal study for the Washington Metropolitan area;
- Air pollution and solid waste disposal practices;
- Solid waste handling by federal installations;
- Abandoned and scrap automobiles;
- Legislative needs for a metropolitan solid waste disposal program;
- Transportation systems;
- Land reclamation;
- Refuse reduction processes;
- Recycling and utilization;
- The need for long-range planning for a solid waste disposal plan;
- Administrative problems in the regional approach to solid waste management;
- Public administration aspects of area-wide planning;
- Assistance available under the solid waste disposal act.

PB-218 253
National Center for Urban and Industrial Health, Cincinnati, Ohio.
ENVIRONMENTAL HEALTH PRACTICE IN RECREATIONAL AREAS. A GUIDE TO THE PLANNING, DESIGN, OPERATION, AND MAINTENANCE OF RECREATIONAL AREAS.

1968, 143p PHS-Pub-1195

Descriptors: (*Recreational facilities, *Sanitary engineering), Planning, Design, Maintenance.

Environmental Health Practice in Recreational Areas is designed to provide guidance to persons responsible for planning, designing, operating, and maintaining recreational areas. The standards presented and the practices recommended have proven successful for many years in Federal, State, and local parks and other recreational places in minimizing or eliminating health and safety hazards.

PB-218 254
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
STATISTICAL SUMMARY OF MUNICIPAL WATER FACILITIES IN THE UNITED STATES JANUARY 1, 1958,
Andrew C. Glass, and Kenneth H. Jenkins. 1963, 57p PHS-Pub-1039

Descriptors: (*Sewage treatment, *United States), Inventories, Tables (Data).

The report summarizes and analyzes data on community water supply and treatment facilities, based on the 1958 Inventory of Municipal Water Facilities. Comprehensive data are presented by States, community population size groups, and major drainage basins.

PB-218 255
Public Health Service, Washington, D. C.
FROM THE HUDSON TO THE POTOMAC: CLEAN WATERS.
1952, 7p PHS-Pub-202

Descriptors: (*Hudson River, *Water pollution), (*Delaware River, *Water pollution), (*Susquehanna River, *Water pollution), (*Potomac River, *Water pollution).

The report presents a very brief overview of the water pollution problems of the Hudson River, Delaware River, Susquehanna River, and Potomac River Drainage basins.

PB-218 256
Public Health Service, Washington, D. C.
CLEANER WATER FOR THE OHIO.
1952, 7p PHS-Pub-203

Descriptors: (*Ohio River Basin, *Water pollution).

The report presents a brief overview of water pollution problems in the Ohio River basin.

PB-218 257
Public Health Service, Washington, D. C.
CLEAN WATER FOR NEW ENGLAND.
1952, 7p PHS-Pub-199

Descriptors: (*New England, *Water pollution).

The report presents a brief overview of water pollution problems in New England.

PB-218 258
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NATIONAL WATER QUALITY NETWORK. SUPPLEMENT 1. STATISTICAL SUMMARY OF SELECTED DATA, OCTOBER 1, 1957-SEPTEMBER 30, 1958.
30 Sep 58, 164p PHS-Pub-663-1959-Suppl-1
See also PB-218 260.

Descriptors: (*United States, *Water pollution), Radioactive contaminants, Organic compounds, Plankton.
Identifiers: *Water quality data.

On June 12, 1959, the Public Health Service issued PHS Publication No. 663, 'National Water Quality Network Annual Compilation of Data, October 1, 1957-September 30, 1958', a compilation of water quality data representing the information collected during the first year of operation of the National Water Quality Network. This Supplement to the original document is a summary of certain segments of the raw data which appear to need immediate consideration because of their urgency or newness -- such as the more recent measures of water quality - radioactivity, organic chemicals and plankton in surface waters. It is not intended to be an exhaustive analysis of the data or an interpretation of what the data may mean. Computations were made and tabulations were prepared for printing on electronic data processing equipment, thus making easily available many comparisons of monthly and annual parameters. Organic chemicals and plankton are summarized on a 20-river basis, by name of river.

PB-218 259
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
WASTE STABILIZATION LAGOONS.

Aug 61, 172p PHS-Pub-872-1961
Proceedings of a Symposium at Kansas City, Mo., 1-5 Aug 60.

Descriptors: (*Sewage treatment, *Lagoons (Ponds)), Meetings.
Identifiers: *Aeration ponds.

Contents: History of raw sewage lagoons in the midwest; History of oxidation ponds in the southwest; Lagoon research project of the public health service at Fayette, Missouri; Research and installation experiences in California; Virginia's experimental installation; Sewage lagoons in Australia; Economics of waste stabilization lagoons in region VI; Use of stabilization ponds in the United States; Missouri basin criteria; Lagoon development and acceptance in Mississippi; Experiences in Canada; Sewage lagoons and mosquito problems; Lagoon disposal of livestock wastes; Operating experiences in the ten Missouri Basin states; Arctic sewage lagoons.

PB-218 260
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NATIONAL WATER QUALITY NETWORK: ANNUAL COMPILATION OF DATA, OCTOBER 1, 1958-SEPTEMBER 30, 1959.

30 Sep 59, 326p PHS-Pub-663-1959
See also PB-218 258.

Descriptors: (*United States, *Water pollution), Radioactive contaminants, Plankton, Coliform bacteria, Organic compounds, Trace elements.
Identifiers: *Water quality data.

This is the second annual compilation of data from the National Water Quality Network of the Public Health Service. This year the Network has added Strontium-90 and heavy metals analyses to the examinations made during the first year. The following examinations are considered to be of greatest value in meeting the objectives of the program: Radioactivity, Plankton populations, Coliform organisms, Organic chemicals, Biochemical, chemical, and physical measurements, and Trace elements.

PB-218 261
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
NATIONAL WATER QUALITY NETWORK: ANNUAL COMPILATION OF DATA, OCTOBER 1, 1957-SEPTEMBER 30, 1958.

30 Sep 58, 239p PHS-Pub-663-1958

Descriptors: (*United States, *Water pollution), Radioactive contaminants, Plankton, Coliform bacteria, Organic compounds.
Identifiers: *Water quality data.

Documented here is a progress report on the first year's operation in the collection of basic water quality data by the Public Health Service under this Act. It is expected that the present limited coverage will be expanded as new arrangements and procedures evolve. The following examinations were considered to be of greatest value in meeting the objectives of the program at this time: Radioactivity, Plankton organisms, Coliform organisms, Organic chemicals, Biochemical, chemical, and physical measurements.

PB-218 262
Bureau of Water Hygiene, Cincinnati, Ohio.
WATER QUALITY BEHAVIOR IN RESERVIORS. A COMPILATION OF PUBLISHED RESEARCH PAPERS,
James M. Symons. 1969, 618p PHS-Pub-1930
Paper copy available from GPO $3.25 as HE.20.1102:W29.

Descriptors: (*Reservoirs, *Water quality), (*Water pollution, Reservoirs), Reviews, Dissolved gases, Oxygen, Aeration.
Identifiers: *Destratification.

The volume contains all the technical papers prepared from data collected for the project Influence of Impoundments and Controlled Releases on Water Quality, from September 1962 through December 1966. Research on this project was divided into two broad categories: (1) investigative research, designed to better understand reservoir water quality behavior; and (2) engineering research, designed to develop engineering methods for the control of reservoir water quality. Papers included in this Compilation cover a review of the literature and a statement of research needs; research on the dissolved oxygen budget in reservoirs, on the behavior of the nitrogen cycle in reservoirs, on the behavior of synthetic organics in stratified reservoirs, and on the use of artificial destratification as an engineering technique for managing and maintaining good quality water in reservoirs. (Author)

PB-218 263
Environmental Protection Agency, Washington, D.C.
PLANNING FOR SOLID WASTE MANAGEMENT. SYMPOSIUM OF STATE AND INTERSTATE SOLID WASTE PLANNING AGENCIES. HELD AT ST. LOUIS, MISSOURI ON 9-11 SEPTEMBER 1969.
Lillian A. Gluckman. 1971, 91p PHS-Pub-2093, BSWM-SW-1p
Paper copy available from GPO $0.45 as stock no. 5502-3307, EP32:P69. Library of Congress catalog card no. 71-611731.

Descriptors: (*Waste disposal, *Management planning), State government, Government policies.
Identifiers: *Solid waste disposal.

Contents:
- Planning for solid waste disposal;
- America's biggest industry: The production of waste;
- Workshops on planning for solid waste management;
- Data for solid waste planning;
- Workshops on data for solid waste planning;
- Intergovernmental cooperation and public involvement in solid waste management;
- Workshops on intergovernmental cooperation and public involvement;
- Solid waste legislation;
- Workshops on solid waste legislation;
- Implementation of solid waste management plans;
- Workshops on implementation of solid waste management.

PB-218 264
Public Health Service, Washington, D.C. Div. of Air Pollution.
AIR POLLUTION - A NATIONAL PROBLEM.

1962, 56p PHS-Pub-975

Descriptors: (*Air pollution, *United States).

Air pollution has been defined as the presence in the outdoor atmosphere of substances in concentrations sufficient to interfere directly or indirectly with man's comfort, safety, or health, or the full use and enjoyment of his property. The booklet presents information about some of the many factors which influence the nature and extent of the nation's air pollution problems. Included are maps which show graphically major potential sources of air pollutants in the 50 States. Also shown are the activities of governmental agencies toward the goal of attaining more effective control of air pollution.

PB-218 265
California Univ., Berkeley.
COMPREHENSIVE STUDIES OF SOLID WASTE MANAGEMENT.
Annual reports nos. 1 and 2,
C. G. Golueke, and P. H. McGauhey. 1970, 480p
BSWM-SW-3rg, PHS-Pub-2039
Grant PHS-EC-00260, PHS-UI-00547
Paper copy available from GPO $4.25 as HE 20.1402:C73.

Descriptors: (*Waste disposal, Management planning), Economic analysis, Public health, Anaerobic processes.
Identifiers: Wet oxidation, *Solid waste disposal.

Contents:
- Data collection and evaluation: (Literature survey and information retrieval, Characteristics and amounts of solid wastes, Waste generation in Santa Clara County, Change in the composition of Berkeley wastes, Definition and coordination of research areas);
- Waste generation and evaluation model;
- Waste collection-treatment-disposal model;
- Waste generation input and management system inputs;
- Planning and economics: (Development of pertinent data on quantity and types of solid wastes, Solid waste generation and land-use planning, Incorporation of technical changes in transportation and disposal of solid wastes, Implications of present and future methods of disposal on private and public expenditure, Santa Clara County study);
- Public health;
- Technology of solid wastes management: (Incineration, Composting, Landfill, Salvage);
- Anaerobic digestion with sewage sludge;
- Wet oxidation of Organic wastes;
- Biological fractionation of organic wastes.

PB-215 266
Oregon State Univ., Corvallis. School of Forestry.
STUDIES ON EFFECTS OF WATERSHED PRACTICES ON STREAMS,
James T. Krygier, George W. Brown, and Peter C. Klingeman. Feb 71, 191p EPA-WQO-13010-EGA-02/71
Paper copy available from GPO $1.50 as EP1.16:13010-EGA-02/71.

Descriptors: (*Lumbering, *Water pollution), (*Forestry, Water pollution), Sediments, Roads, Erosion, Heat budget, Solar heating.
Identifiers: *Clear cutting.

A number of studies were undertaken related to effects of clearcut logging on water quality and the process affected in small streams. Water temperature studied before and after logging was increased significantly where stream cover was removed. Energy balances of small streams were measured and predictive models were developed. Road building significantly increased sediment yield in clearcut and patch cut watersheds. Logging itself was not an important sediment contributor. Methods for sampling bed load and suspended sediment were developed. Bed load constituted 70 percent of suspended load during peak discharges. (Author)

PB-215 267
National Center for Urban and Industrial Health, Chevy Chase Md., Environmental Sanitation Program.
FOOD SERVICE SANITATION MANUAL, INCLUDING A MODEL FOOD SERVICE SANITATION ORDINANCE AND CODE. 1962 RECOMMENDATIONS OF THE PUBLIC HEALTH SERVICE.

1962. 101p PHS-Pub-934

Descriptors: (*Food sanitation, *Manuals), Regulations, Standards.

During the past 15 years, advances in the field of food technology, together with a distinct change in the social pattern of living in this country, have perceptibly altered the eating habits of the American people and the types of food-service operations being employed in public food-service establishments. In recognition of these changes, a new food service sanitation manual has been developed as a guide for both public health agencies and the food-service industry. It sets forth the need, purpose, and scope of a food-protection program, and suggests ways and means whereby effective programs may be implemented.

PB-215 268
Public Health Service, Washington, D.C. Div. of Engineering Services.
HANDBOOK ON SANITATION OF RAILROAD PASSENGER CAR CONSTRUCTION. STANDARDS OF SANITATION APPLICABLE TO THE CONSTRUCTION OF RAILROAD PASSENGER AND DINING CARS. REVISION.
1959, 23p PHS-Pub-95-Rev-59
See also PHS-Pub-66, PB-216 692 and PHS-Pub-83, PB-215 935.

Descriptors: (*Railroad cars, *Sanitary engineering), Standards.

Contents: General standards applying to all types of railroad passenger cars (Water supply facilities, Toilet and lavatory facilities, Ventilating and heating); Coaches; Sleeping cars (Linen lockers, Drinking water facilities); Dormitory cars or dormitory portions of combination cars (Linen lockers, Crew's clothing lockers, Ventilation); Lounge, club, and parlor cars; Dining cars and bar cars (Floors, Walls and ceilings, Doors and windows, Lighting, Ventilation, Toilet facilities, Water, Handwashing facilities, Construction of equipment, Equipment for cleaning and bactericidal treatment of utensils, Equipment for storing and handling utensils and nonperishable foods, Equipment for disposal of wastes from food and drink, Refrigeration, Wholesomeness of food and drink, Storage and display of food and drink, Employee cleanliness).

PB-215 269
Public Health Service, Washington, D.C. Div. of Sanitation.
HANDBOOK ON SANITATION OF AIRLINES. STANDARDS OF SANITATION FOR THE CONSTRUCTION AND OPERATION OF COMMERCIAL PASSENGER AIRCRAFT AND SERVICING AND CATERING FACILITIES.
1953, 39p PHS-Pub-308

Descriptors: (*Aircraft, *Sanitary engineering).

Contents: Construction plans (Terminal facilities, Aircraft facilities); Catering-point sanitation (Floors, Walls and ceilings, Doors and windows, Lighting, Ventilation, Toilet facilities, Water supply, Handwashing facilities, Construction of equipment and utensils, Cleaning and bactericidal treatment of equipment and utensils, Storage and handling of equipment and utensils, Disposal of wastes, Refrigeration, Wholesomeness of food and drink, Protection of food, Cleanliness of employees, Miscellaneous, Disease control, Transportation of food to aircraft); Aircraft sanitation (Food and beverage service, Ice, Refuse handling); Control of drinking water (Water piping system, Aircraft water system, Hydrants, Water hose, Water tanks and tank carts); Handling and disposal of wastes from aircraft (Aircraft toilet facilities, Handling of toilet wastes, Disposal of toilet wastes, Handling of aircraft refuse).

PB-215 270
Communicable Disease Center, Atlanta, Ga.
INSECTICIDES FOR THE CONTROL OF INSECTS OF PUBLIC HEALTH IMPORTANCE.
Insect control series,
Harry D. Pratt, and Kent S. Littig. 1962, 47p PHS-Pub-772-ICS-2

Descriptors: (*Insecticides, *Manuals), Public health.

It is the purpose of the paper to give a brief introduction to the insecticides of interest to public health workers and to the ways they may be prepared for use.

PB-215 271
Communicable Disease Center, Atlanta, Ga.
SANITATION IN THE CONTROL OF INSECTS AND RODENTS OF PUBLIC HEALTH IMPORTANCE TRAINING GUIDE. PART IV.
Insect control series,
Wilfred H. Johnson. 1960, 50p PHS-Pub-772-ICS-4

Descriptors: (*Insect control, Sanitation), (*Rodent control, Sanitation).

Sanitation in insect and rodent control includes the three phases of refuse handling: storage, collection, and disposal, together with premise maintenance and the proper storage of products and materials. Emphasis is placed on the relationship of each activity to the existing or potential insect and rodent problem.

PB-215 272
Public Health Service, Washington, D.C.
REPORT OF THE COMMITTEE ON ENVIRONMENTAL HEALTH PROBLEMS TO THE SURGEON GENERAL.
1962, 248p PHS-Pub-908

Descriptors: (*Public health, *Pollution), Air pollution, Food sanitation, Industrial medicine, Radiobiology, Water pollution.

The report provides an analysis-review of ongoing programs, an appraisal of the national needs in environmental health, an evaluation of the role of the Public Health Service in meeting these needs and of mechanisms by which these needs might be met, and a projection of broad but firm guidelines within which the future program of the Public Health Service might be developed.

PB-215 273
Dow Chemical Co., Freeport, Tex. Texas Div.
DEVELOPMENT OF A SELECTIVE ALGAECIDE TO CONTROL NUISANCE ALGAL GROWTH,
Bernard L. Prows, and William F. McIlhenny. Jan 71, 53p EPA-WQO-1412814-04-71
Contract DI-14-12-814

Descriptors: (*Algicides, *Bioassay), Pesticides, Toxicology.

The objective of this project was to discover a compound which would effectively and economically control the growth of nuisance species of bluegreen algae and would also exert a minimum impact on the more desirable aquatic life. A computer search was made of some 80,000 compounds and thirty-three were selected for testing. Those compounds which gave at least 80% control at 2.0 ppm against both Microcystis aeruginosa and Anabaena flos-aquae, the specified target species of blue-green algae, were selected for secondary screening tests at 1.0,0.5 and 0.1 ppm. Of the thirty-three compounds tested, four were selected for further research in the long-range algaecidal development program. In addition, an organism, Ochromonas ovalis, was discovered whose phagocytic action against Microcystis sp. was enhanced by compounds having algaecidal properties. (Author Modified Abstract)

PB-215 274
Public Health Service, Washington, D.C. Div. of Engineering Services.
METHODS OF MAKING SANITATION RATINGS OF MILKSHEDS.
1958, 23p PHS-Pub-678

Descriptors: (*Dairies, Ratings), (*Milk, Ratings), (*Food sanitation, Milk).

Contents: The public health service rating method (Number of producer dairies and pasteurization plants to be surveyed; Random selection of producer dairies and plants to be surveyed; Recording of inspection data; Recording of laboratory and other test data; Rating of raw milk for pasteurization; Rating of pasteurization plants; Rating of pasteurized milk and milk products; Procedure to be followed when milk and milk products are received from beyond the limits of routine inspection of the health authority being surveyed; Computation of enforcement rating; Preparation of rating officer's report; Summary of survey results; Supplementary narrative report; Recommendations of milk sanitation rating officer).

PB-215 275
Public Health Service, Cincinnati, Ohio. Water and Sanitation Investigations.
MANUAL OF RECOMMENDED WATER-SANITATION PRACTICE RECOMMENDED BY THE PUBLIC HEALTH SERVICE.
1946, 43p PHS-Pub-525
An unrevised reissuance of the former Public Health Bulletin No. 296.

Descriptors: (*Water supply, *Reviews), (*Water treatment, *Reviews).

The manual is to serve as a guide to Public Health Service engineers in evaluating the sanitary features of water supplies with which they are concerned. The text is divided into four sections. Part I gives those features of water-supply systems

which are of sufficient importance to be included in a sanitary survey, and lists major sanitary defects and health hazards, which, if present, would be detrimental to the safety of the water supply. Parts II and III deal, respectively, with recommended sanitary requirements for water treatment and for water-distribution systems. Part IV has been added as an explanatory discussion of the bacteriological and chemical requirements for potable drinking water as set forth by the 1946 Public Health Service Drinking Water Standards.

PB-218 276
Public Health Service, Washington, D. C. Div. of Environmental Engineering and Foof Protection.
SCREENING TESTS FOT THE DETECTION OF ABNORMAL MILK.
1965, 36p PHS-Pub-1306
An addendum, Evaluation Check List for Wisconsin Mastitis Test, is inserted.

Descriptors: (*Milk, Tests), (*Food sanitation, Milk).

The milk regulations in most progressive areas require that milk shall be from one or more healthy cows; that it shall be practically free of colostrum; and that milk otherwise abnormal should not be offered for sale. The screening tests described in this booklet are all based on the number of leucocytes in the milk. They are four which are currently in common use, as well as a recent modification of the CMT test. The Milk Quality Test (MQT)has not been included in this publication because of the scarcity of well-documented, scientific reports concerning the significance of positive results in terms of leucocyte counts.

PB-218 277
Public Health Service, Washington, D. C.
CLEAN WATER IS EVERYBODY'S BUSINESS.
1950, 30p PHS-Pub-11

Descriptors: (*Water pollution, Reviews).

The report very briefly describes the problem and abatement of water pollution.

PB-218 278
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
1957 INVENTORY MUNICIPAL AND INDUSTRIAL WASTE FACILITIES (1957). VOLUME 6. REGION VI. IOWA, KANSAS, MINNESOTA, MISSOURI, NEBRASKA, NORTH DAKOTA, SOUTH DAKOTA.
1958, 246p PHS-Pub-622-Vol-6

Descriptors: (*Sewage treatment, *Water pollution), (*Water treatment, *Water pollution), (*Iowa, Water pollution), (*Kansas, Water pollution), (*Minnesota, Water pollution), (*Missouri, Water pollution), (*Nebraska, Water pollution), (*North Dakota, Water pollution), (*South Dakota, Water pollution), Inventories.

The Inventory contains the latest available data for all sources of pollution, both municipal and industrial, which are of significance in water pollution control programs. The seven state area includes: Iowa, Kansas, Minnesota, Nebraska, North Dakota, and South Dakota.

PB-218 279
Health Services and Mental Health Administration, Rockville, Md. Office of Grants Management.
DIRECTORY OF STATE, TERRITORIAL, AND REGIONAL HEALTH AUTHORITIES, 1970.
1970, 120p PHS-Pub-75-Rev-70

Descriptors: (*Public health, *Directories).

Contents:
- State and territorial health officers (all States);
- Designated State and territorial agencies for comprehensive health planning;
- Areawide comprehensive health planning agencies;
- Regional medical programs;
- State agencies other than health departments administering crippled children's services programs;
- State agencies other than health departments administering hospital and medical facilities construction programs;
- State agencies other than health departments administering mental health programs;
- State and territorial health authorities, by State.

PB-218 280
Public Health Service, Washington, D.C. Div. of Sanitation.
HANDBOOK ON SANITATION OF VESSEL WATERING POINTS. DESIGN AND OPERATION OF SANITATION FACILITIES FOR PIERS OR WHARVES WHERE VESSELS LOAD WATER.
1953, 16p PHS-Pub-274

Descriptors: (*Ships, *Water supply), (*Harbor facilities, Water supply).

The handbook is concerned with the protection of the water during the course of delivery from an approved source to the filling connections of the vessel's potable-water storage tank. The principles of sanitation set forth herein are intended to serve as guides for those who are charged with the design, construction, or operation of facilities on wharves and piers for loading potable water on vessels, and for the personnel of the Public Health Service and any State and local agencies concerned with the supervision of vessel watering points.

PB-218 281
Public Health Service, Washington, D.C. Div. of Air Pollution.
TROUBLED AIR.
Chart book.
Jul 63, 30p PHS-Pub-977

Descriptors: (*Air pollution, Reviews).

Man has displayed an amazing capacity to drastically alter his natural environment. The booklet explores, in text and graphs, what has produced air pollutants, their characteristics, the damage they do, and what is being done to curtail further defilement of our troubled air.

PB-218 282
Arctic Health Research Center, Anchorage, Alaska.
THE ALASKA DIETARY SURVEY, 1956-1961.
Environmental health series rept. on Arctic Health,
Christine A. Heller, and Edward M. Scott. 1961, 281p PHS-Pub-999-AH-2

Descriptors: (*Eskimos, *Diets), (*Alaska, *Human nutrition).

The diet of Eskimos has always been of interest because these people have managed to survive under adverse circumstances by utilization of unusual natural resources. The present study was begun in 1956 with the following objectives: To determine the present food habits of Alaskan Eskimos and Indians; To estimate the degree of their dependence on local food; To estimate the adequacy of the diet; To predict medical or public health problems which might arise from inadequate diet.

PB-218 283
Public Health Service, Washington, D. C. Div. of Water Supply and Pollution Control.
INVENTORY OF MUNICIPAL WASTE FACILITIES (1962). REGION IX. ALASKA, ARIZONA, CALIFORNIA, HAWAII, NEVADA, OREGON, AND WASHINGTON.
1963, 140p PHS-Pub-1065-Vol-9

Descriptors: (*Sewage treatment, *Water pollution), (*Alaska, Water pollution), (*Arizona, Water pollution), (*California, Water pollution), (*Hawaii, Water pollution), (*Nevada, Water pollution), (*Oregon, Water pollution), (*Washington (State), Water pollution), Inventories, Tables (Data).

This Inventory contains the latest available data for all sources of municipal pollution which are of significance in water pollution control programs. In the listings, each non-community entry is referred to the nearest community, whenever possible. Entries appear in alphabetical order according to community. Entries listed under the same community are alphabetized by name, under that community. Following each State listing is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility.

PB-218 284
National Communicable Disease Center, Atlanta, Ga.
PROCEDURES FOR THE ISOLATION AND IDENTIFICATION OF MYCOBACTERIA,
Annie L. Vestal. Jun 69, 151p PHS-Pub-1995
Errata sheet inserted.

Descriptors: (*Mycobacterium, Identifying), Bacteriology, Tests, Biological laboratories, Antiinfectives and antibacterials, Drug tolerance, Manuals.

Contents:
- Safety in the laboratory;
- Isolation and identification of Mycobacteria;
- Drug susceptibility tests.

PB-218 285
Public Health Service, Washington, D.C. Div. of Environmental Engineering and Food Protection.
ENVIRONMENTAL ENGINEERING FOR THE SCHOOL A MANUAL OF RECOMMENDED PRACTICE.
1973, 90p PHS-Bull-856
Prepared in cooperation with Office of Education, Washington, D. C. Div. of State and Local School Systems. Rept. no. OE-21014.

Descriptors: (*School buildings, *Environments), Architecture, Design criteria, Environmental engineering.

Between the ages of five and sixteen, the average child spends many of his waking hours within the school environment. That this environment should be both as suitable and as healthful as possible has been an accepted premise for many years. Yet a long-standing need has existed for a comprehensive, over-all statement of basic environmental criteria for schools, by which either existing or planned facilities could be evaluated. The publication endeavore to meet that need. The basic recommendations and the standards that it contains are the result of three years of thorough and careful study, in cooperation with school officials, sanitary engineers, sanitarians, and expert consultants across the Nation.

PB-218 286
National Institutes of Health, Bethesda, Md. Div. of Research Grants.
MEDICAL AND HEALTH RELATED SCIENCES THESAURUS,
Lynda Lee McGee, Allan Z. Loren, Gordon Adams, and William J. Holliman, Jr. Mar 63, 220p PHS-Pub-1031

Descriptors: (*Thesauri, *Medicine).

The thesaurus is offered as a facility to research workers and others interested in the field of information. It was compiled in connection with the preparation of the Research Grants Index. The documents included in the Index represented extremely specialized investigations in widely diversified fields of medical science and related public health, for which there was no adequate dictionary of terms available as an indexing guide.

PB-218 287
Communicable Disease Center, Atlanta, Ga.
CLINICAL HNDBOOK ON ECONOMIC POISONS; EMERGENCY INFORMATION FOR TREATING POISONING,
Wayland J. Hayes, Jr. 1963, 50p PHS-Pub-476-Rev
Revision of report dated 1956.

Descriptors: (*Poisons, *Handbooks), (*Pesticides, *Toxicology), Toxic diseases, Phosphorus organic compounds, Carbamates, Chlorine organic compounds, Rodenticides, Pyrethrum, Fungicides, Herbicides, Organic solvents, Insecticides.

The Handbook replaces the 'Clinical Memoranda on Economic Poisons,' which were first issued in March 1950 as separate releases on several new insecticides. Attention has been given to those materials that are manufactured in large amounts, that are known to have caused posioning relatively frequently, or that are of special interest for some other reason. Sections have been devoted to arsenic, thallium, phosphorus, and kerosene because they are leading causes of deaths associated with pesticides. The Handbook was prepared primarily for the guidance of physicians in the diagnosis and treatment of persons who may have had extensive or intensive exposure to economic poisons; however, it contains general information that may be of interest to others also.

PB-218 290
Public Health Service, Dallas, Tex. Region VII.
WATER RESOURCES STUDY BUFFALO RIVER BASIN-ARKANSAS. STUDY OF POTENTIAL NEEDS AND VALUE OF WATER STORAGE FOR MUNICIPAL, INDUSTRIAL AND QUALITY CONTROL PURPOSES.
Jun 64, 36p

Descriptors: (*Buffalo River Basin, *Reservoirs), (*Arkansas, *Water resources), Forecasting.

The purpose of this study was to determine water requirements to the year 2020 for municipal, industrial, and water quality control purposes in a 17-county area of north-central Arkansas, encompassing the Buffalo and contiguous river basins. The conclusions reached in this report evolved from projected economic developments and anticipated needs for water supply and stream quality preservation.

PB-218 291
Public Health Service, Washington, D.C. Div. of Water Supply and Pollution Control.
AN INDUSTRIAL WASTE GUIDE TO THE COTTON TEXTILE INDUSTRY.
1959, 29p PHS-Pub-677

Descriptors: (*Textile industry, *Industrial waste treatment), Cotton textiles, Industrial wastes.
Identifiers: *Water pollution control.

This Industrial Waste Guide to the Cotton Textile Industry is intended primarily to assist the operators and managers of cotton textile processing plants to utilize, reduce, and otherwise suitably dispose of their waste waters. It will also be useful in informing consultants and personnel of regulatory agencies of the sources and pollutional characteristics of cotton textile wastes and the status of developments in waste treatment.

PB-218 292
Public Health Service, Dallas, Tex. Region VII.
SUPPLEMENT TO REPORT ON MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS, SAN GABRIEL RIVER, LOWER BRAZOS RIVER SYSTEM, TEXAS.

Dec 60, 9p
Prepared in cooperation with Army Engineer District, Fort Worth, Tex.

Descriptors: (*San Gabriel River, *Reservoirs), (*Texas, *Water resources), (*Brazos River Basin, *Reservoirs).

The purpose of this supplement is to update and revise certain information presented in the original report. These corrective measures became necessary when: The non-federal interest rate used for discounting and determining annual costs was changed from 3 to 4 per cent; A structure at the Laneport site was added to the plan which had originally called for just two reservoirs on the San Gabriel River; A revised estimate was made of the amount of ground water that municipal and industrial interests might totally develop in the area by the year 2010; The size and cost of the proposed Somerville project on Yegua Creek were changed. The information provided is intended to revise only those sections or topics of the original report which are related to the four items mentioned above.

PB-218 293
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY AZTEC RESERVOIR SANTA FE RIVER, NEW MEXICO. STUDY OF NEEDS AND VALUE OF STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL.
May 65, 23p

Descriptors: (*Santa Fe River Basin, *Reservoirs), (*New Mexico, *Water resources), Forecasting.
Identifiers: Santa Fe County (New Mexico).

The purpose of this study is to determine the need for and value of storage for water requirements to the year 2070 for municipal, industrial, and water quality control purposes in the Santa Fe River basin, which is encompassed primarily by Santa Fe County, New Mexico.

PB-218 294
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY AQUILLA CREEK WATERSHED-LOWER BRAZOS RIVER SYSTEM, TEXAS. STUDY OF NEEDS AND VALUE OF STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL.

Oct 65, 41p

Descriptors: (*Aquilla Creek, *Reservoirs), (*Brazos River Basin, Reservoirs), (*Texas, *Water resources), Forecasting.
Identifiers: Falls County (Texas), Hill County (Texas), McLennan County (Texas).

The purpose of this study is to estimate the water requirements for municipal and industrial water supply, and water quality control purposes to the years 2025 and 2075 in the Aquilla Creek watershed. Estimates are made of the value of benefits attributable to the storage of water for these purposes in the Federally proposed Aquilla Creek Reservoir project.

PB-218 295
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS SAN GABRIEL RIVER LOWER BRAZOS RIVER SYSTEM TEXAS.

Jul 60, 38p
Prepared in cooperation with Army Engineer District, Fort Worth, Texas.

Descriptors: (*San Gabriel River, *Reservoirs), (*Texas, *Water resources), (*Brazos River Basin, Reservoirs), Forecasting.

The report, for the San Gabriel River, is one of a series of three companion reports on projects being studied for the tributaries of the lower Brazos River. These projects are related from a water supply standpoint, in that a common market for municipal and industrial water will exist in the lower Brazos River Basin.

PB-218 296
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS BENTON RESERVOIR, SALINE RIVER, ARKANSAS.
Nov 60, 36p
Prepared in cooperation with Army Engineer District, Vicksburg, Miss.

Descriptors: (*Saline River Basin, *Reservoirs), (*Arkansas, *Water resources), Forecasting.
Identifiers: *Saline County (Arkansas).

The report presents data and information relevant to the determination of water requirements, to the year 2010, for municipal and industrial purposes in the Saline River Basin and how these needs may be met. The report includes an estimate of the annual benefits which could be ascribed to storage allocated to water supply. Consideration is given to locale, natural resources, economy, and growth prospects together with the effects of existing and future pollution. The evaluation of water needs is founded on forecasts for population increase and industrial expansion developed to the year 2010.

PB-218 297
Public Health Service, Dallas, Tex. Region VII.
STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL EL DORADO, DOUGLASS, AND TOWANDA RESERVOIRS WALNUT RIVER BASIN KANSAS.

Apr 63, 33p
Prepared in cooperation with the Army Engineer District, Tulsa, Okla.

Descriptors: (*Walnut River Basin, *Reservoirs), (*Kansas, *Water resources), Forecasting.

The report presents the results of an investigation to determine water requirements to the years 2020 and 2070 for municipal, industrial, and water quality control purposes in the Walnut River basin and how these needs may be met. An estimate of the average annual benefits which could be ascribed to storage allocated to these purposes is evolved from projected economic developments and anticipated needs for water supply and stream quality preservation.

PB-218 298
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS LAVON RESERVOIR EAST FORK OF THE TRINITY RIVER TEXAS.
Jan 61, 41p
Prepared in cooperation with Army Engineer District, Fort Worth, Texas.

Descriptors: (*Lavon Reservoir, Requirements), (*Texas, *Water resources), (*Trinity River, *Reservoirs), Forecasting.
Identifiers: *Dallas (Texas).

Contents: Description of project; Description of study area; Economics and population; Water requirements; Benefits of storage.

PB-218 299
Public Health Service, Portland, Oreg. Region IX.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, MILL CREEK PROJECT, WALLA WALLA RIVER BASIN, WASHINGTON-OREGON.
Final rept.

Dec 65, 85p

Descriptors: (*Walla Walla River Basin, *Reservoirs), (*Washington (State), *Water resources), (*Oregon, *Water resources), Forecasting.

The investigation was undertaken by the Public Health Service, Division of Water Supply and Pollution Control, to determine the potential needs for and value of storage for municipal, industrial, and quality control purposes. Water requirements were examined for areas within Walla Walla and Columbia Counties, in Washington, and Wallowa and Umatilla Counties, in Oregon. Future needs were projected to the year 2010, with an interim point at 1985. An economic base study and forecast of future population and industrial growth was prepared for this purpose and is summarized in this report.

PB-218 300
Federal Water Pollution Control Administration, Kansas City, Mo. Region VI.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, SKUNK RIVER BASIN, IOWA.
Aug 66, 77p

Descriptors: (*Skunk River Basin, *Reservoirs), (*Iowa, *Water resources), Forecasting.

The purpose of the study was to determine the present and future needs and value of municipal and industrial water supply and storage for water quality control on the Skunk River in the reaches affected by the proposed reservoirs. This includes parts of the following Iowa counties: Hamilton, Boone, Marshall, Polk, Jasper, Powshiek, Marion, Mahaska, Keokuk, Washington, Wapello, Jefferson, Henry, Lee and Des Moines. The water requirements and the means and benefits (both tangible and intangible) of meeting those requirements have been investigated. The scope of the study covers water storage needs during a one-hundred year study period, 1960 to 2060.

PB-218 301
Public Health Service, Dallas, Tex. Region VII.
STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY COPAN, SAND AVANT, AND SKIATOOK RESERVOIRS AND STREAM QUALITY CONSIDERATIONS LOWER VERDIGRIS RIVER BASIN OKLAHOMA.
Jun 61, 43p
Prepared in cooperation with Army Engineer District, Tulsa, Oklahoma.

Descriptors: (*Verdigris River Basin, *Reservoirs), (*Oklahoma, *Water resources), Forecasting.

The purpose of the investigation was to determine the present and anticipated future needs for storage in the four reservoirs to meet projected municipal and industrial water demands; to examine the waste disposal and stream quality problems incident to such water use; and to estimate the monetary values of storage for water supply and for stream quality maintenance. A special feature of the study is the consideration of the effect of canalization of the lower Verdigris River on the stream's capacity to assimilate municipal and industrial wastes.

PB-218 302
Public Health Service, Kansas City, Mo. Region VI.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY WEARS CREEK BASIN MISSOURI. STUDY OF THE NEEDS AND VALUE OF STORAGE FOR MUNICIPAL AND INDUSTRIAL WATER SUPPLY AND WATER QUALITY CONTROL.
Aug 65, 15p

Descriptors: (*Wears Creek Basin, *Reservoirs), (*Missouri, *Water resources), Forecasting.

The purpose of this study is to determine the need for and value of storage for municipal and industrial water supply and quality control in the Wears Creek Basin, located in central Missouri. The study covers a 50 year period from 1965 to 2015 as requested by the Corps of Engineers.

PB-218 303
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS SOMERVILLE RESERVOIR YEGUA CREEK TEXAS.
Apr 61, 40p
Prepared in cooperation with Army Engineer District Fort Worth, Tex.

Descriptors: (*Yegua Creek, *Reservoirs), (*Texas, *Water resources), Forecasting.

The purpose of the study was to recommend the prospective needs for municipal and industrial water supply which might be satisfied from the proposed Somerville Reservoir project, and to determine whether or not it is desirable (from the standpoints of economics and water quantity and quality) to meet these prospective needs from the Somerville project. Projections of future populations, industrial expansion, and water requirements were made for the entire lower Brazos River Basin. Consideration was also given to how the future water requirements of this area may best be met.

PB-218 304
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
RECONNAISSANCE INVESTIGATION WATER SUPPLY AND WATER QUALITY CONTROL STUDY. SKAGIT RIVER BASIN PUGET SOUND BASIN, WASHINGTON, D.C.
Nov 66, 55p

Descriptors: (*Skagit River Basin, *Reservoirs), (*Oregon, *Water resources), Forecasting.

The Corps of Engineers requested data on present municipal and industrial (M and I) water supply and water quality control needs in the Skagit River Basin, and on such future requirements as could be estimated within the scope of a reconnaissance study involving 19 possible reservoir sites. These data are to be used to determine the advisability of initiating detailed investigations of specific storage sites at a later time. The study area covered in this report consists of the portion of the Skagit River Basin in the United States, Whidbey Island, and the coastal sections of Skagit County. Evaluations include projected conditions to the year 2020, with interim points at 1980 and 2000. An economic base study was prepared for this purpose and is summarized in this report.

PB-218 305
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, EDWARDS UNDERGROUND RESERVOIR, TEXAS.
Jan 65, 55p

Descriptors: (*Edwards aquifer, *Water quality), (*Texas, *Water resources), Forecasting.

The purpose of the study was to estimate the water requirements for municipal and industrial and water quality control purposes in the Edwards Underground Reservoir area of Texas and the surrounding study area to the year 2075. Estimates are also made of the value of benefits attributable to the Federal reservoir projects which will provide storage of water for these purposes. In addition to determining requirements, an area-wide plan for supplying these needs is developed, which provides for orderly and efficient utilization of potential water resources within the area, and gives full recognition to all permits, commitments, and agreements executed by local interests.

PB-218 307
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, KAW RESERVOIR, ARKANSAS RIVER BASIN, KANSAS AND OKLAHOMA.
Jul 65, 80p

Descriptors: (*Arkansas River Basin, *Reservoirs), (*Kansas, *Water resources), (*Oklahoma, *Water resources), Forecasting.

The purpose of this study was to determine water requirements to the years 2020 and 2070 for municipal and industrial and water quality control purposes in the 10-county area lying within north-central Oklahoma and south-central Kansas which could be served by Kaw Reservoir. A plan of how these projected needs may be met is given, and an estimate of the average annual value of benefits which could be ascribed to storage allocated to these purposes is evolved from projected economic developments and anticipated needs for water supply and stream quality preservation. (Author)

PB-218 308
Public Health Service, Washington, D.C.
WATER POLLUTION IN THE UNITED STATES. A REPORT ON THE POLLUTED CONDITION OF OUR WATERS AND WHAT IS NEEDED TO RESTORE THEIR QUALITY.
Water pollution series no. 1.
May 51, 45p PHS-Pub-64
Library of Congress Catalog Card no. 51-60812.

Descriptors: (*Water pollution, Reviews).

The report presents the basic facts of our water pollution problem-how and where the pollution originates; its sources, their number and location; what is needed to get it under control.

PB-218 400
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS PECAN BAYOU-COLORADO RIVER BASIN, TEXAS.
Jul 61, 32p
Prepared in cooperation with Army Engineer District, Fort Worth, Texas.

Descriptors: (*Pecan Bayou, *Reservoirs), (*Texas, *Water resources), Forecasting.

Projections of future populations, industrial expansion, and water requirements were made for the following municipalities located in the probable 'market area' for water impounded in the Pecan Bayou watershed: Abilene, Albany, Anson, Bangs, Breckenridge, Brownwood, Coleman, Cross Plains, Early, Goldthwaite, Merkel, Rising Star, and Santa Anna. Consideration was also given to how the future water requirements of these cities may best be met.

PB-218 401
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS DE GRAY RESERVOIR QUACHITA RIVER ARKANSAS-LOUISIANA.
Nov 61, 60p
Prepared in cooperation with Army Engineer District, Vicksburg, Mississippi.

Descriptors: (*Ouachita River Basin, *Reservoirs), (*Arkansas, *Water resources), (*Louisiana, *Water resources), Forecasting.

The report presents data and information relevant to the determination of water requirements, to the year 2010, for municipal and industrial purposes in the Ouachita River Basin and how these needs may be met. The report includes an estimate of the annual benefits which could be ascribed to storage allocated to water supply.

PB-218 402
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS WHITE OAK CREEK RESERVOIR TEXAS.
Apr 60, 16p
Prepared in cooperation with Army Engineer District, New Orleans, Louisiana.

Descriptors: (*White Oak Creek, *Reservoirs), (*Texas, *Water resources), Forecasting.
Identifiers: *Franklin County (Texas).

The public Health Service, Region VII Office, Dallas, Texas prepared a preliminary evaluation of the need for water supply storage and its value (benefits) for each of the following streams: Cypress Creek above Ferrells Bridge Reservoir; White Oak Creek; Little Cypress Creek; Bayou Dorcheat; Black and Cypress Bayous; and Bayou Bodcau. White Oak Creek is considered in this report.

PB-218 403
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS WALLISVILLE RESERVOIR TRINITY RIVER TEXAS.

Feb 60, 30p
Prepared in cooperation with Army Engineer District, Galveston, Texas.

Descriptors: (*Trinity River Basin, *Reservoirs), (*Texas, *Water resources), Forecasting.

The study recommends prospective needs for municipal and industrial water supply in the vicinity of the Trinity River Basin and determines the economic value of meeting these needs from the proposed Wallisville Reservoir.

PB-218 404
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, SPRING RIVER BASIN, KANSAS, MISSOURI, AND OKLAHOMA.
Mar 68, 43p

Descriptors: (*Spring River Basin, *Reservoirs), (*Kansas, *Water resources), (*Missouri, *Water resources), (*Oklahoma, *Water resources), Forecasting.

The purpose of this study was to determine the need for and value of storage for water requirements to the year 2075 for municipal, industrial, and water quality control purposes in the Spring River basin. The study area included the counties which encompass the Spring River basin drainage area: Ottawa County, Oklahoma; Crawford and Cherokee Counties, Kansas; and Barry, Barton, Jasper, Lawrence, and Newton Counties, Missouri. (Author)

PB-218 405
Federal Water Pollution Control Administration, Portland, Oreg.
RECONNAISSANCE INVESTIGATION WATER SUPPLY AND WATER QUALITY CONTROL STUDY, YAQUINA RIVER BASIN, OREGON.
Jun 66, 15p

Descriptors: (*Yaquina River Basin, *Reservoirs), (*Oregon, *Water resources), Forecasting.

The Corps of Engineers requested data on present municipal and industrial (Mand I) water supply and water quality control needs for Yaquina River Basin, Oregon, and on such future requirements as could be estimated within the scope of a reconnaissance study. These data are to be used to determine the advisability of initiating detailed investigations of specific storage sites in the Yaquina River Basin.

PB-218 406
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, GRANITE RESERVOIR, PECOS RIVER BASIN ABOVE SANTA ROSA, NEW MEXICO.
Aug 67, 25p

Descriptors: (*Pecos River Basin, *Reservoirs), (*New Mexico, *Water resources), Forecasting.
Identifiers: San Miguel County (New Mexico), Guadalupe County (New Mexico).

The purpose of this study is as follows: Determine present water use and estimate future water requirements; Determine capabilities and suitabilities of existing and potential water resources to meet current and future needs; Estimate the effect of present and future return flows on the quality of waters in the basin; and Determine the need for and value of storage in Federal reservoir projects for water supply and/or water quality control. The area studies includes San Miguel and Guadalupe Counties in northeastern New Mexico. (Author)

PB-218 407
Federal Water Pollution Control Administration, New York. Region II.
WATER QUALITY CONTROL STUDY TOCKS ISLAND RESERVOIR DELAWARE RIVER BASIN.

Jun 66, 75p

Descriptors: (*Delaware River Basin, *Reservoirs), (*New Jersey, *Water resources), Forecasting, Tocks Island Reservoir.

The purposes of this study are to determine the need for water quality control from year 1960 to 2010, to set forth the locations at which flow regulation should be considered, to estimate the draft on storage that would be needed for water quality control, to identify the beneficiaries, and to estimate the benefits attributable to possible inclusion of storage in the proposed Tocks Island reservoir and other Delaware River Basin Projects to meet these demands. Studies conducted for this water quality control study were limited to the Delaware River and Estuary from Liston Point to the proposed Tocks Island reservoir, within ten miles of each side of the water course.

PB-218 408
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY STUDY RED RIVER NAVIGATION PLAN OKLAHOMA, TEXAS, ARKANSAS AND LOUISIANA. A STUDY OF THE VALUE OF MUNICIPAL AND INDUSTRIAL WATER SUPPLY OF NAVIGATION IMPROVEMENTS PROPOSED FOR THE MAIN STEM OF RED RIVER FROM ITS MOUTH TO SHREVEPORT, LOUISIANA.
Dec 64, 34p
Prepared in cooperation with Army Engineer District, New Orleans, Louisiana.

Descriptors: (*Red River, *Reservoirs), (*Oklahoma, Water resources), (*Texas, Water resources), (*Arkansas, Water resources), (*Louisiana, Water resources).
Identifiers: Forecasting.

The purpose of this study was to determine the water requirements to the years 2025 and 2075 along the main stem of the Red River downstream from Denison Dam, Texas, and how these needs may be met. An estimate of the average annual value of benefits to municipal and industrial uses which could be ascribed to the proposed navigation works is evolved from projected economic developments and anticipated needs for water supply. (Author)

PB-218 409
Public Health Service, Dallas, Tex. Region VII.
WATER SUPPLY AND WATER QUALITY CONTROL REQUIREMENTS ELEVEN POINT RIVER, ARKANSAS AND MISSOURI.

Nov 62, 22p
Prepared in cooperation with Army Engineer District, Little Rock, Arkansas.

Descriptors: (*Eleven Point River, *Reservoirs), (*Arkansas, *Water resources), (*Missouri, *Water resources), Forecasting.

The report presents data and information pertinent to the determination of water requirements and corresponding benefits for the years 2020 and 2070 for municipal, industrial, and water quality control purposes in a seven-county area of Arkansas and Missouri, encompassing Eleven Point and surrounding river basins. Conclusions are based on projections of economic and demographic parameters within the study area.

PB-218 410
Public Health Service, Dallas, Tex. Region VII.
WATER RESOURCES STUDY - CENTRAL OKLAHOMA NAVIGATION PROJECT, DEEP FORK RIVER BASIN, OKLAHOMA.
Mar 64, 36p
Prepared in cooperation with Army Engineer District, Tulsa, Okla.

Descriptors: (*Deep Fork River Basin, *Reservoirs), (*Oklahoma, *Water resources), Forecasting.

The purpose of this study was to determine water requirements to the years 2025 and 2075 for municipal, industrial, and water quality control purposes in the Deep Fork River Basin, located in east-central Oklahoma, and how these needs may be met. An estimate of the average annual value of benefits which could be ascribedto storage allocated to these purposes is evolved from projected economic developments and anticipated needs for water supply and stream quality preservation.

PB-218 411
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER QUALITY STUDY, OZARK WELL FIELD, ARKANSAS RIVER BASIN, ARKANSAS.
May 67, 58p

Descriptors: (*Arkansas River Basin, *Reservoirs), (*Arkansas, Water resources), (*Water wells, *Water pollution).

The purpose of this study was to determine what effect the Arkansas River Multiple-Purpose Plan will have on the quality of the city of Ozark's well water supply. Particular attention was directed toward the Ozark Lock and Dam project which is now under construction since the well field will adjoin the reservoir. This study includes an estimation of the chemical quality of water to be impounded in the Ozark Reservoir, the probable withdrawal rate from the wells for municipal water for the year 1970, the chemical quality that can be expected in the municipal water supply, and the extent of damages, if any, that may happen to the supply as a result of the completion of the Arkansas River Multiple-Purpose Plan. (Author)

PB-218 416
Dynatech Corp., Cambridge, Mass.
AN ELECTROCHEMICAL METHOD FOR REMOVAL OF PHOSPHATES FROM WASTE WATERS.
Water pollution control research series,
Shafik E. Sadek. Feb 70, 53p FWQA-17010-02/70
Contract DI-14-12-405
Paper copy available from GPO $0.50 as stock no. I67.1314:17010-02/70.

Descriptors: (*Electrolytic cells, *Chemical removal (Sewage treatment)), (*Sewage treatment, Electrolytic cells), (*Phosphorus, Chemical removal (Sewage treatment)), Detergents.

Phosphates in waste water may be removed electrochemically utilizing sacrificial electrodes. The electrode metal is first dissolved by the flow of current then precipitates out, removing from solution the phosphate ions. This removal is either dependent on chemical reaction of the metal cation and the phosphate anions or, possibly, on the adsorption of the phosphate by the metal hydroxide floc. Data on the phosphate removal was gathered using both aluminum and iron electrodes. Essentially complete removal was found to occur on using 300 coulombs/liter of charge flow with normal phosphate concentrations for both types of electrodes. Treatment costs (excluding labor and filtration) have been estimated when using iron and aluminum electrodes respectively. Exploratory tests indicated that flotation by means of the hydrogen generated during the electrolysis may be used to remove suspended solids from raw sewage while phosphates are being removed. (Author Modified Abstract)

PB-218 417
Johns Hopkins Univ., Baltimore, Md.
MATHEMATICAL MODELING OF SOLID WASTE COLLECTION POLICIES. VOLUMES 1 AND 2.
Final rept.,
Marcus M. Truitt, Jon C. Liebman, and Cornelius W. Kruse. 1970, 303p BSWM,-PHS-SW-lrg, Pub-2030
Grant PHS-UI-00539
Paper copy available from GPO $2.25 as HE20.1402:M42/Vol. 1 and 2.

Descriptors: (*Waste disposal, *Mathematical models), (*Computerized simulation, Waste disposal), Collection, FORTRAN, Computer programs.
Identifiers: *Solid waste disposal, IBM 7094 computer, FORTRAN 4, *Baltimore (Maryland).

Extensive observation was made of refuse collection in urban residential areas in the city of Baltimore and its environs. All data were collected in the context of a classification of four neighborhood types of household densities. Three models were prepared in FORTRAN IV for simulation of refuse collection systems on an IBM 7094 computer. Data within the models can be easily changed so as to allow other cities' system characteristics to be substituted for the Baltimore data. (Author)

PB-218 418
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
THE PUBLIC HEALTH ACCEPTABILITY OF IN-FLIGHT WASTE DISPOSAL.
Final rept.,
F. M. Compton. Nov 56, 85p
Contract AF 33 (616)-55-14

Descriptors: (*Aircraft, *Waste disposal), (*Toilet facilities, Aircraft), International relations.

The primary objective of this study was to determine feasibility of in-flight aircraft waste disposal and recommend future work needed to resolve the problem. A theoretical method has been developed for estimating ground contamination resulting from in-flight discharge. A primary purpose was to provide a basis for authoritative judgment of the potential health hazard. Concepts secured from a review of scientific literature have been incorporated into the report.

PB-218 419
Public Health Service, Washington, D.C. Div. of Engineering Services.
SANITARY FOOD SERVICE. INSTRUCTOR'S GUIDE TO BE USED FOR TRAINING FOOD--SERVICE PERSONNEL. REVISED.
Jun 53, 217p PHS-Pub-90-1953
Also pub. as Joint Army, Navy, and Air Force publication TM 8-525/NAVMED P-1333/AFM 146-7. Reprinted 1960.

Descriptors: (*Food dispensing, *Manuals).

Health authorities and others concerned have long recognized the need of education in recommended sanitary practices for food service personnel. It is expected that this manual will serve a great variety of purposes, such as used by state and local health departments as a basis for training food-service personnel. Local and state distributive education specialists should find it useful in conducting classes in food service and sanitation. The Armed Services and the owners and managers of eating and drinking establishments may wish to use is as the basis of their own in-service training programs.

PB-218 474
Environmental Health Center, Cincinnati, Ohio.
CHLOROMELAMINE FORMULA 96P - BACTERICIDAL, CHEMICAL AND PHYSICAL PROPERTIES.
Final rept.,
Milton J. Foter, George R. Weber, and Lloyd R. Setter. Jul 52, 110p
Contract AF 33 (038)-22425

Descriptors: (*Disinfectants, *Melamines), (*Chlorine organic compounds, Disinfectants), (*Bactericides, Melamines), Effectiveness, Food processing.
Identifiers: *Melamine/trichloro.

The study was initiated to determine the suitability and germicidal efficiency of Chloromelamine Formula 96P for use by the Air Force for disinfection of mess gear, fresh vegetables, and for possible use as a general disinfectant.

PB-218 475
Federal Water Quality Administration, Washington, D.C. Div. of Technical Support.
INVENTORY OF MUNICIPAL WASTE FACILITIES IN THE UNITED STATES (1968). STATISTICAL SUMMARY,
Kenneth H. Jenkins. 1968, 47p
Paper copy available from GPO $0.30 as I67.22:968/Summary.

Descriptors: (*Sewage treatment, *United States), Inventories.

The publication presents a summary and analysis of data on sewage disposal and treatment facilities in the United States and territories. Detailed information on individual facilities will be published in the 1968 Inventory of Municipal Waste Facilities. The data reflect the status, characteristics and types of disposal and treatment facilities in place on January 1, 1968. The inventory is the fifth to be taken on a national basis. Certain data from the statistical summaries of the previous inventories have been included in this publication to allow comparison with the 1968 inventory and to provide a measure of progress in the control and disposal of municipal wastes. Analyses of the data and of trends in the methods of collection, treatment and disposal of the wastes are included in the text.

PB-218 477
Public Health Service, Washington, D.C. Div. of Air Pollution.
STATE LAWS ON AIR POLLUTION: A DIGEST,
Samuel M. Rogers, and Sidney Edelman. 1960, 131p PHS-Pub-711-1960

Descriptors: (*Air pollution, *Legislation), (*State government, Air pollution).

The Digest of state laws relating to air pollution was prepared from an examination of pertinent state statutes. It is anticipated that the Digest will be revised and supplemented from time to time to enhance its usefulness and to keep it current with new legislation.

PB-218 479
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, ARKANSAS RIVER SUBBASIN, COLORADO.
Feb 68, 88p

Descriptors: (*Arkansas River Basin, *Reservoirs), (*Colorado, *Water resources), Forecasting.

The purpose of this study was to appraise water requirements to the year 2070 for municipal, industrial, and water quality control purposes in the Arkansas River basin above John Martin Reservoir. The results presented are based on projected economic developments and anticipated needs for water supply and stream preservation in the study area. (Author)

PB-218 480
Federal Water Pollution Control Administration, Dallas, Tex. South Central Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, CEDAR POINT RESERVOIR, KANSAS.
Jul 66, 40p

Descriptors: (*Grand River Basin, *Reservoirs), (*Neosho River Basin, *Reservoirs), (*Kansas, *Water resources), Forecasting.

The purpose of this study was to examine information, previously supplied by the Public Health Service, which deals with water supply and quality control needs in the Grand (Neosho) River basin, as it pertains to the Cedar Point project study area. This study area was determined as Marion, Chase, and Lyon Counties, Kansas, which encompass the Cottonwood River watershed. The time period covered in the study was extended to the year 2070. (Author)

PB-218 481
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS, BIG HILL CREEK RESERVOIR, BIG HILL CREEK, KANSAS.
Jul 60, 30p
Prepared in cooperation with Army Engineer District, Tulsa, Okla.

Descriptors: (*Verdigris River Basin, *Reservoirs), (*Kansas, *Water resources), Forecasting, Big Hill Creek.

The Committee on Public Works of the House of Representatives, United States, requested that the Board of Engineers for rivers and harbors review the reports on the Verdigris River, Kansas, submitted in House Document No. 440, 76th Congress, and other pertinent reports with a view of determining whether or not it is advisable to construct a reservoir on Big Hill Creek, a tributary of the Verdigris River, for flood control, water supply storage, and other allied purposes. This report is concerned with the determination of the need of providing municipal and industrial water supply in the proposed reservoir.

PB-218 482
Public Health Service, Dallas, Tex. Region VII.
MUNICIPAL AND INDUSTRIAL WATER REQUIREMENTS, BAYOU DORCHEAT RESERVOIR, ARKANSAS.
Oct 60, 36p
Prepared in cooperation with Army Engineer District, New Orleans, La.

Descriptors: (*Bayou Dorcheat Basin, *Reservoirs), (*Arkansas, *Water resources), Forecasting.

The report presents the pertinent information and data relating to the determination of future water requirements for municipal and industrial purposes in the Bayou Dorcheat Basin, and how these requirements may be met. Consideration is given to water supply storage at either of two sites within the basin, together with the effects of existing and future pollution. The evaluation of water needs encompasses locale, natural resources, economy, growth prospects, projections of municipal and industrial water use and waste production to the year 2010.

PB-218 483
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
MUNICIPAL WATER TREATMENT INVENTORIES OF HISTORICAL SIGNIFICANCE - 1910 AND 1915,
Ralph Porges. Jan 58, 14p

Descriptors: (*Water treatment, *History), (*United States, Water treatment), Inventories.

The report contains a quantitative analysis of public water treatment extant in the United States during a five year period from 1910 thru 1915.

PB-218 484
Public Health Service, Kansas City, Mo. Region VI.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, RED RIVER OF THE NORTH BASIN, MINNESOTA AND NORTH DAKOTA.
Jul 65, 133p
Prepared in cooperation with Army Engineer District, St. Paul, Minn.

Descriptors: (*Red River of the North, *Reservoirs), (*Minnesota, *Water resources), (*North Dakota, *Water resources), Forecasting.

The purpose of this study is to determine the present and future needs and value of municipal and industrial water supply and storage for water quality control in the main stem and principal tributaries of the Red River of the North. The study determines water requirements, and the means and benefits of meeting those requirements for the above purposes. The scope of this study covers water storage needs during the 50-year study period, 1965 to 2015. Value of benefits is based on 100-year project life.

PB-218 485
Federal Water Pollution Control Administration, Boston, Mass. Northeast Region.
WATER SUPPLY AND WATER QUALITY CONTROL STUDY, BLUE MARSH RESERVOIR, SCHUYLKILL RIVER BASIN, PENNSYLVANIA.
1968, 74p

Descriptors: (*Schuylkill River Basin, *Reservoir), (*Pennsylvania, *Water resources), Forecasting.

The purpose of the study was to determine the need for and value of storage of water in the proposed Blue Marsh Reservoir for municipal and industrial water supply and for water quality control. This reservoir is proposed by the Corps of Engineers for multi-purpose development. The area considered in this study encompasses portions of Berks, Montgomery, Chester, Bucks, Delaware, and Philadelphia counties, in southeastern Pennsylvania. Project needs and benefits have been evaluated for the period 1970 to 2020. (Author)

PB-218 486
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
BIOLOGICAL NUISANCE PROBLEMS. SUPPLEMENT E TO PUBLIC HEALTH ASPECTS OF PROPOSED SALT WATER BARRIER AND LAND RECLAMATION PROJECTS, SAN FRANCISCO BAY.
Jan 60, 71p
Prepared in cooperation with Public Health Service, San Francisco, Calif.

Descriptors: (*San Francisco Bay, *Biological surveys).

The report covers an evaluation and classification of biological nuisances in the study area, an estimate of the biological nuisances which may be encountered in the fresh water pools impounded by any of several proposed barrier systems, the effects of nutrients on the production of biological nuisances and methods of control of biological nuisances.

PB-218 487
Public Health Service, New York. Region II.
JAMAICA BAY, NEW YORK. AN INVESTIGATION OF THE EFFECTS OF HURRICANE SURGE CONTROL STRUCTURES ON WATER QUALITY OF JAMAICA BAY.
Jun 63, 36p

Descriptors: (*Jamaica Bay, *Water pollution), (*New York, Water pollution), Flood control, Hurricanes.

Jamaica Bay, an estuary on the southern shore of Long Island and lying partly within New York City, is surrounded by densely populated areas. Because of property damage associated with extreme tides due to the close passage of large storms, consideration is being given to the construction of hurricane barriers to moderate the extreme storm surges. Since each hurricane barrier plan includes features which alter the natural hydraulic regime, it is possible that the water quality of the system may be altered by the implementation of any such plan. It is necessary as part of the initial study of possible schemes to evaluate the effects of each scheme on the water quality of the system. This report presents the results of the requested evaluation.

PB-218 492
National Air Pollution Control Administration, Washington, D.C.
DANGER IN THE AIR: SULFAR OXIDES AND PARTICULATES.
May 70, 19p NAPCA-Pub-1
Paper copy available from GPO $0.40 as stock no. HE20.1302.SU5.

Descriptors: (*Air pollution, *Sulfur oxides), (*Air pollution, *Particles), Reviews.

The report describes the sources of sulfer dioxide and particulate matter in our atmosphere, the detrimental effects of these pollutants on our environment, and the action that must be taken to control the production of these pollutants.

PB-218 493
Federal Water Pollution Control Administration, Washington, D.C.
THE ECONOMICS OF CLEAN WATER. VOLUME II. ANIMAL WASTES PROFILE.
Mar 70, 98p

Descriptors: (*Water pollution, *Agricultural wastes), (*Ruminants, Water pollution), Surface water runoff, Cattle, Poultry, Swine.
Identifiers: Manure, *Feedlot wastes.

Previous reports point out that water pollution from animal wastes is a very significant and growing problem. This report admits to a lack of data, however, the objective is to provide a comprehensive view of the problem, to setup a framework that can be used for future study, and to discuss the known facts and point out areas with potential for fruitful future study. The report concludes that water pollution as a result of improper or inadequate disposal of animal wastes can be a major but manageable problem.

PB-218 494
Health Services and Mental Health Administration, Rockville, Md. Office of Grants Management.
DIRECTORY OF LOCAL HEALTH AND MENTAL HEALTH UNITS.

1969, 123p PHS-Pub-118-Rev-69

Descriptors: (*Public health, *Directories).

The Directory of Local Health and Mental Health Units has been compiled as of September 1, 1969, from data reported to the Health Services and Mental Health Administration by State health and mental health officers and directors of local health units. Information on local governmental mental health units is included. These units, reported by 23 states, are listed immediately after the local health units for each State. Units are grouped by type of organization and listed alphabetically within each type. The four types of organizations are (1) County; (2) City; (3) Local health district; and (4) State health district.

PB-218 495
Public Health Service, Washington, D. C. Div. of Air Pollution.
AIR POLLUTION PUBLICATIONS. A SELECTED BIBLIOGRAPHY 1963-1966.
1966, 153p PHS-Pub-979
Prepared for National Conference on Air Pollution, December 12-14, 1966, Washington, D. C.

Descriptors: (*Air pollution, *Bibliographies).

Contents: Foreign literature - Translations; Biosciences and medicine; Plants; Material deterioration; Sources (Industrial and non-industrial, Transportation); Measurement; Control methods and equipment; Methods and facilities; Atmospheric phenomena; Physical and chemical concepts; Administrative and social (Economics, Legislation, Regulation and Ordinances, Plans, Programs and Training, Public information and social attitudes, National air sampling network (NASN), Continuous air monitoring program (CAMP), Standards and criteria).

PB-218 496
Public Health Service, Washington, D. C.
STATISTICAL SUMMARY OF WATER SUPPLY AND TREATMENT PRACTICES IN THE UNITED STATES,
John R. Thoman. 1953, 55p PHS-Pub-301

Descriptors: (*Water treatment, *United States), Inventories.

The report summarizes and discusses data on public water supply and treatment facilities in the United States based on the 1948 Inventory of Water and Sewage Facilities (unpublished). The data are presented in tables giving national summaries of source of supply and treatment, treatment plants, disinfection and selected unit processes. Detailed statistics by States, population groups, and geographical areas are given.

PB-218 497
Federal Water Pollution Control Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
POTATO PROCESSING WASTES: PILOT PLANT STUDIES OF SECONDARY TREATMENT.
Progress rept. 1 Jan-1 Jun 67,
Robert W. Vivian, and Kenneth A. Dostal. Jan 68, 85p PR-4

Descriptors: (*Food processing, *Industrial waste treatment), Lagoons (Ponds), Pilot plants, Potatoes, Aeration.
Identifiers: *Potato processing, *Water pollution control.

The report outlines the operation of and results from a pilot plant used to treat potato wastes from January 1 to June 1, 1967. Primary clarifier effluent was fed to the first of two small lagoons in series. The first lagoon was operated as a complete mixed anaerobic unit and the second lagoon was aerated with a small surface aerator. Hydraulic loadings were varied to give detention times of 8.8, 5.0, and 2.4 days in each lagoon.

PB-218 499
Environmental Control Administration, Cincinnati, Ohio. Analytical Reference Service.
WATER PESTICIDES NUMBER 3,
Bernard J. Moorman, and Earl F. McFarren. 1970, 77p PHS-Pub-2052, PHS-ARS-38
See also report dated 1966, PB-173 984.

Descriptors: (*Water analysis, *Pesticides), (*Gas chromatography, *Pesticides), (*Water pollution, Pesticides), DDT, Endrin, Dieldrin, Heptachlor, Accuracy, Standards.
Identifiers: Lindane.

The study evaluates the precision and accuracy of gas chromatography in the analysis of lindane, heptachlor, heptachlor epoxide, dieldrin, p,p'-DDT, and endrin in water.

PB-218 500
Environmental Control Administration, Cincinnati, Ohio. Analytical Reference Service.
WATER NUTRIENTS NUMBER 1,
Raymond J. Lishka, Laurella A. Lederer, and Earl F. McFarren. 1966, 87p PHS Pub-999-WP-42, PHS-ARS-Study-27

Descriptors: (*Water analysis, *Nutrients), (*Water pollution, Nutrients), Silicon dioxide, Inorganic phosphates, Inorganic nitrates, Ammonia, Nitrogen organic compounds, Accuracy.

Nutrients in water are important because they promote biological responses that may interfere with some desired use of the water by man. Analysis of the various forms of these nutrients is routine in many laboratories, but the reliability of the results obtained has been questionable. This study evaluates the precision and accuracy of the commonly used analytical methods for the measurement of silica, phosphate, nitrate nitrogen, ammonia nitrogen, and organic nitrogen.

PB-218 501
Environmental Control Administration, Cincinnati, Ohio. Analytical Reference Service.
WATER TRACE ELEMENTS NUMBER 2,
Raymond J. Lishka, and Earl F. McFarren. 1966, 57p Pub-999-WP-40, PHS-ARS-Study-26

Descriptors: (*Water analysis, *Trace elements), (*Water pollution, Trace elements), Selenium, Beryllium, Boron, Arsenic, Vanadium, Accuracy.

The study evaluates the precision and accuracy of the commonly used analytical methods for the determination of selenium, beryllium, boron, arsenic, and vanadium in water.

PB-218 502
Public Health Service, Cincinnati, Ohio.
OHIO RIVER POLLUTION SURVEY. VOLUME II. MAJOR TRIBUTARY BASINS.
Final rept.
1942, 212P
See also volume 3, PB-217 285.

Descriptors: (*Ohio River Basin, *Water pollution), Tables (Data).
Identifiers: *Water quality data.

The Ohio River Pollution Survey has been presented in summaries covering the main Ohio River, minor tributary basins and the nineteen major tributary basins. Volume II contains the summaries on the following: Allegheny River Basin; Monongahela River Basin; Beaver River Basin; Muskingum River Basin; Hocking River Basin; Kanawha River Basin; Little Kanawha River Basin; Big Sandy River Basin; and Guyandot River Basin.

PB-218 503
Columbia Univ., New York.
ESTIMATIONS DES PARAMETRES DE LA LOI DES VALEURS EXTREMES ET CONSEQUENCES ECONOMIQUES (ESTIMATIONS OF THE PARAMETERS OF THE LAW OF EXTREME VALUES AND ECONOMIC CONSEQUENCES),
Neil Goldstein. 1966, 9p
Grant FWPCA-WP-00457-01
Text in French. Pub. in Revue de Statistique Appliquee, v14 n2 p47-55 1966.

Descriptors: (*Economic factors, Statistical analysis).
Identifiers: Parameter estimation.

For abstract, see 73 01.

PB-218 504
Edison Water Quality Lab., N.J.
OIL SKIMMING DEVICES.
Clean water rept.

May 70, 92p

Descriptors: (*Water pollution, Oils), (*Skimmers, *Oils), Surveys.
Identifiers: *Oil pollution removal.

The document describes a number of different oil collection devices presently available, giving the manufacturer's name and other pertinent information on each method. In addition, some information covered by various patents on the subject of skimmers is also included. The skimming devices described in the report consist primarily of three different types: weir, drum and belt. The skimmers are classified as belonging to one of the major categories. The weir type uses the principle of overflowing a weir to separate the oil from the surrounding water, whereas the belt and drum types utilize the principle of selective adsorption of the oil from the water. In each category, skimmers have been listed in alphabetical order. No attempt has been made to determine the relative effectiveness of any of the skimming methods or to compare their merits. The equipment is described in as much detail as practicable from the information available. Additional data can be secured from the reference indicated, or by contacting the manufacturer or inventor directly.

PB-218 505
Federal Water Quality Administration, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
NATURAL FREEZING FOR DEWATERING OF ALUMINUM HYDROXIDE SLUDGES,
J. B. Farrell, J. E. Smith, Jr., R. B. Dean, E. Grossman, III, AND O. L. Grant. 1970, 5p
Pub. in Jnl. of American Water Works Association, v62 n12 p787-791 Dec 70.

Descriptors: (*Sludge disposal, *Dewatering), (*Aluminum hydroxides, Dewatering), (*Freezing, Dewatering), Aluminum slufates.
Identifiers: Sludge treatment.

The treatment of wastewaters with aluminum sulfate results in large amounts of low-solids sludge, from which it is difficult to remove water. One method of dewatering this sludge is by natural freezing, and the authors describe the feasibility of this process herein. (Author)

PB-218 506
Public Health Service, Portland, Oreg. Div. of Water Supply and Pollution Control.
PAPER MILL POLLUTION IN PUGET SOUND,
A. F. Bartsch. 1963, 10p
Pub. in Transactions of the North American Wildlife and Natural Resources Conference, (28th), March 4 - 6, 63, p 369-377.

Descriptors: (*Puget Sound, *Water pollution), (*Paper industry, Water pollution), (*Washington (State), Water pollution), Pulp mills, Ecology.

The study program on Puget Sound includes field research and related studies at the four specified locations where pulp and paper mill wastes are discharged to the Sound waters. The over-all objective of this work is to determine the effects of the mill wastes on water quality, water uses, and the marine environment.

PB-218 509
Public Health Service, Cincinnati, Ohio. Ohio-Tennessee Drainage Basins Office.
MAHONING RIVER INVESTIGATION. EFFECTS ON WATER QUALITY OF PROPOSED MAHONING-GRAND RIVER DIVERSION. APPENDIX IV.
Jun 53, 21p

Descriptors: (*Mahoning River, *Reservoirs), (*Ohio, *Water resources), Stream flow, Water pollution, Flushing.

The report has been prepared at the request of the District Engineer, Corps of Engineers, Pittsburgh, Pennsylvania. Essentially, it is a re-evaluation of a previous report 'Effects on Water Quality of Proposed Mahoning-Grand River Diversion' prepared by the Public Health Service in December 1949. With respect to the requirements for organic pollution abatement, however, this whole problem has been restudied, using data obtained by the Ohio State Department of Health in a comprehensive stream sanitation study of the Mahoning River Basin extending over a period of several months (May to November, inclusive) in 1952. In addition, consideration has been given to reduction in industrial organic pollution which will result from waste treatment or plant process changes initiated primarily for the control of other types of pollution, such as suspended and floating solids and taste and odor producing substances.

PB-218 510
Public Health Service, Washington, D.C. Div. of Sanitary Engineering Services.
MUNICIPAL AND INDUSTRIAL WASTE FACILITIES - 1957 INVENTORY. VOLUME 9. REGION IX - ARIZONA, CALIFORNIA, NEVADA, OREGON, WASHINGTON, ALASKA, HAWAII.
1957, 273p PHS-Pub-622-Vol-9

Descriptors: (*Sewage treatment, Inventories), (*Industrial waste treatment, Inventories), Arizona, California, Nevada, Oregon, Washington (State), Alaska, Hawaii.

The Inventory contains data for all sources of pollution, both municipal and industrial, which are of significance in water pollution control programs. Entries appear in alphabetical order according to community. Following the listing for each State there is a table showing those sewage disposal facilities which serve more than one of the entries, together with the names of all entries which are served by the particular facility. (Author)

PB-218 511
Battelle-Northwest, Richland, Wash.
PHOSPHORUS REMOVAL FROM EFFLUENTS IN ALUMINA COLUMNS,
Lloyd L. Ames, Jr., and Robert B. Dean. 1970, 13p
Contract DI-14-12-413
Pub. in Jnl. of Water Pollution Control Federation, v42 n5 pt2 pR161-R172 May 70.

Descriptors: (*Sewage treatment, Chemical removal (Sewage treatment)), (*Chemical removal (Sewage treatment), *Phosphorus), Aluminum oxides, Columns (Process engineering).

The effects of various compositional changes on phosphorus removal by alumina columns from a synthetic secondary wastewater effluent were studied.

PB-218 512
Federal Water Pollution Administration, Corvallis, Oreg. Pacific Northwest Water Lab.
FORMAL DISCUSSION OF PAPER I-3, IMPACT ON SALMON OF SPRAYING INSECTICIDE OVER FORESTS BY P. F. ELSON AND C. J. KERSWILL, PUB. IN PROCEEDINGS OF THE INTERNATIONAL CONFERENCE (3RD), HELD IN MUNICH, GERMANY, 5-9 SEPTEMBER 1967, P70-72,
A. F. Bartsch. 1966, 4p

Descriptors: (*Aquatic biology, *DDT), (*Ecology, DDT), (*Water pollution, DDT), Pesticides, Canada.
Identifiers: *Spruce budworm.

The report is an example of a comprehensive, thorough, and painstaking examination of the impact of DDT on the aquatic environment and its inhabitants. In technically sound fashion, this field study examines the environmental conditions that prevailed before, during, and after an extensive and prolonged program of aerial spraying to control the ravages of spruce budworm in New Brunswick, Canada, forests.

PB-218 513
Bureau of Solid Waste Management, Rockville, Md.
1968 NATIONAL SURVEY OF COMMUNITY SOLID WASTE PRACTICES. REGION 2. DELAWARE, NEW JERSEY, NEW YORK: VOLUME 1,
Anton J. Muhich, Albert J. Klee, and Charles R. Hampel. 1969, 164p PHS-Pub-1866-Vol-1
See also Volume 2, PB-218 514.

Descriptors: (*Waste disposal, *Delaware), (*Waste disposal, *New Jersey), (*Waste disposal, *New York), Earth fills, Inventories.
Identifiers: *Solid waste disposal, Sanitary landfills.

The data listings, reporting forms, and specifications for the Survey were developed over a period of more than five months through the joint efforts of representatives of the Bureau of Solid Waste Management, State agencies, and private consultants. The Survey provides information on the types and amounts of solid waste collected, their disposition, and the resources (manpower, equipment, facilities, monies, etc.) required to carry out collection, reduction, and disposal activities. In addition to the inventory data, evaluations of existing reduction and disposal facilities are also provided. It must be emphasized, however, that the Survey is community-oriented. In general, little information was obtained from industries that handle their own waste or utilize their own on-site disposal facilities. (Author)

PB-218 514
Bureau of Solid Waste Management, Rockville, Md.
1968 NATIONAL SURVEY OF COMMUNITY SOLID WASTE PRACTICES. REGION 2. PENNSYLVANIA: VOLUME 2,
Anton J. Muhich, Albert J. Klee, and Charles R. Hampel. 1969, 412p PHS-Pub-1866-Vol-2
See also Volume 1, PB-218 513.

Descriptors: (*Waste disposal, *Pennsylvania), Inventories, Earth fills.
Identifiers: *Solid waste disposal, Sanitary landfills.

The data listings, reporting forms, and specificatopms for the Survey were developed over a period of more than five months through the joint efforts of representatives of the Bureau of Solid Waste Management, State agencies, and private consultants. The Survey provides information on the types and amounts of solid waste collected, their disposition, and the resources (manpower, equipment, facilities, monies, etc.) required to carry out collection, reduction, and disposal activities. In addition to the inventory data, evaluations of existing reduction and disposal facilities are also provided. It must be emphasized, however, that the Survey is community-oriented. In general, little information was obtained from industries that handle their own waste or utilize their own on-site disposal facilities. (Author)

PB-218 515
Communicable Disease Center, Atlanta, Ga.
AIR FILTRATION OF MICROBIAL PARTICLES,
Herbert M. Decker, Lee M. Buchanan, Lawrence B. Hall, and Kenneth R. Goddard. Jun 62, 51p
PHS-Pub-953
Prepared in cooperation with Army Chemical Corps, Fort Detrick, Frederick, Md.

Descriptors: (*Air filters, *Microorganisms), Filtration, Performance evaluation.

The authors of this monograph have been associated for several years with the problem of protecting personnel against disease-producing organisms found in hospitals or in biological laboratories. Although there are various means of cleaning air, the authors' experience has been widest in the use of air filtration as a method for removing bacteria from the air. This monograph is written for the specific purpose of making the benefits of this experience available to personnel such as architects, engineers, hospital administrators, and research investigators concerned with the control of pathogenic biological organisms. Although this report is oriented to biological air filtration, certainly the information also is applicable to industries using radioactive materials and to others, such as precision instrument industries or spacecraft projects that require physically clean air.

PB-218 516
Public Health Service, Washington, D.C.
REPORT ON A PROPOSED NEW WATER STANDARD IN WISCONSIN, WITH SPECIAL REFERENCES TO ITS POSSIBLE APPLICATION TO THE MILWAUKII WATER SUPPLY,
H. W. Streeter. Sep 38, 24p

Descriptors: (*Water pollution, Standards), Wisconsin, Water quality.
Identifiers: *Water pollution standards, *Milwaukee (Wisconsin).

In a report by representatives of the Wisconsin State Board of Health on an investigation of an outbreak of gastroenteritis which occurred at Milwaukii in February, 1938, it was concluded, after reviewing extensive epidemiological evidence, that the outbreak was most probably water-borne and it was further recommended that a new standard of quality be adopted for chlorinated water supplies. This study proposes and recommends a new standard with special reference to its possible application to Milwaukee water, and reviews the laboratory results of examinations of this water.

PB-218 517
Public Health Service, Portland, Oreg. Region IX.
SYMPOSIUM OF RESEARCH ON PROBLEMS RELATING TO WATER POLLUTION IN THE PACIFIC NORTHWEST (1ST).

7 Nov 57, 10p

Descriptors: (*Pacific Northwest, *Water pollution), Meetings.

The symposium described was to further and make more objective the research on problems relating to water pollution.

PB-218 519
Public Health Service, Kansas City, Mo. Region VI.
REPORT OF SURVEY, NORTH PLATTE RIVER, TORRINGTON, WYOMING, BRIDGEPORT, NEBRASKA, NOVEMBER 30 - DECEMBER 6, 1962.
1962, 76p

Descriptors: (*Platte River Basin, *Water pollution), (*Wyoming, Water pollution), (*Nebraska, Water pollution).
Identifiers: *Water quality data.

A monitoring survey for the reach of the North Platte River between Torrington, Wyoming and Bridgeport, Nebraska was conducted by the Public Health Service and the States of Wyoming and Nebraska in late 1962. The survey was designed to obtain data for evaluating improvement in River water quality following the construction of pollution abatement facilities by municipalities and industries subsequent to the 1961 survey.

PB-218 534
National Center for Air Pollution Control, Washington, D.C.
AIR QUALITY CRITERIA FOR SULFUR OXIDES.

Mar 67, 238p PHS-Pub-1619
Paper copy available from GPO $1.25 as FS2.9313:50.

Descriptors: (*Sulfur oxides, *Air pollution), (*Bibliographies, Sulfur oxides), Public health, Epidemiology, Exposure, Corrosion.
Identifiers: Water pollution effects (Humans), Water pollution effects (Animals), Water pollution effects (Plants), Air pollution effects (Materials).

Contents:
- Physical and chemical properties of the oxides of sulfur;
- Atmospheric reactions of sulfur oxides;
- Sources of oxides of sulfur in the atmosphere;
- Measures of oxides of sulfur in the atmosphere;
- Concentrations and variations of oxides of sulfur in the air;
- Effects of air polluted with the oxides of sulfur on visual range, materials, and vegetation;
- Effects of oxides of sulfur on man and animals.

PB-218 838
Federal Water Pollution Control Administration, Portland, Oreg. Northwest Region.
WATER QUALITY CONTROL AND MANAGEMENT: SNAKE RIVER BASIN.

Sep 68, 75p

Descriptors: (*Snake River Basin, *Water pollution), (*Idaho, Water pollution), (*Oregon, Water pollution).

The report summarizes the findings of studies which have provided the impetus to Federal-State water pollution control planning in the Snake Basin since 1962. It tells where pollution exists and why it exists. It tells what corrective action has al-

ready been initiated. It tells what further steps must be taken to preserve and enhance the quality of water resources of the basin. And it serves as a blueprint from which to build future programs for the water quality essential to the many uses and enjoyment of water in the Snake Basin.

PB-218 947
Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
WATER POLLUTION STUDIES: LOWER BEAR RIVER BASIN.
Sep 56, 120p

Descriptors: (*Bear River Basin, *Water pollution), (*Idaho, Water pollution), (*Utah, Water pollution).
Identifiers: *Water quality data.

The study is concerned with the chemical, physical and bacteriological quality of the lower Bear River and its tributaries in the vicinity of the Idaho/Utah State line, as well as with information on waste contributing industries in the area. Field operations were conducted from November 7 through December 9, 1955.

PNE-327
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE ENVIRONMENTAL SURVEILLANCE: PROJECT BUGGY I.

Sep 70, 128p

Descriptors: (*Nuclear explosions, Radioactive contaminants), (*Nuclear excavation, *Radioactive contaminants).
Identifiers: *Gasbuggy operation.

The Southwestern Radiological Health Laboratory (SWRHL) provided off-site radiological surveillance support for Project Buggy I, conducted at the Nevada Test Site (NTS) at 0904 PST on March 12, 1968. The radioactive effluent released from this event traveled northward from the NTS and was detected in the environment as far north as Montana. The highest exposure rate observed off-site was 8.5 mR/hr measured during cloud passage at an unpopulated location approximately 80 miles from the point of detonation. The highest integrated exposure observed in the off-site area, as measured by thermoluminescent dosimeters, was 11.3 mR in the same unpopulated area. Thermoluminescent dosimeters located at populated areas indicated no external radiation exposures above background. These dosimeters were placed prior to the detonation to document the external radiation exposure from cloud passage plus 8 days of residual activity.

PNE-916-F
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR PROJECT PALANQUIN.

May 70, 128p

Descriptors: (*Nuclear explosions, Radioactive contaminants), (*Nuclear excavation, *Radioactive contaminants), Fallout, Radiation effects, Cratering, Air pollution.
Identifiers: *Palanquin operation.

The Public Health Service provided off-site surveillance in support of the Palanquin event conducted on April 14, 1965. This support consisted of tracking the effluent, monitoring radiation dosage to the off-site population, and collecting environmental samples (air, milk, water, and vegetation). (Author Modified Abstract)

PNE-959
Southwestern Radiological Health Lab., Las Vegas, Nev.
REPORT OF OFF-SITE SURVEILLANCE FOR PROJECT CABRIOLET.

May 71, 70p

Descriptors: (*Nuclear explosions, Radioactive contaminants), (*Nuclear excavation, *Radioactive contaminants), Fallout.
Identifiers: *Cabriolet operation.

Project Cabriolet was a 2.5-kt nuclear excavation experiment conducted at the Nevada Test Site on January 26, 1968, as part of the Plowshare program. The results of the off-site radiological surveillance program conducted for this event by the Public Health Service are presented. (Author)

PNE-G-46
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE RADIOLOGICAL SURVEILLANCE PROGRAM FOR PROJECT GASBUGGY.

Jun 69, 26p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Gasbuggy operation.

Project Gasbuggy, an experiment to stimulate gas recovery by nuclear means, was conducted on December 10, 1967, as part of the USAEC Plowshare Program. The procedures used by the U. S. PHS, which is responsible for the comprehensive Off-Site Radiological Safety Program, and the data obtained in connection with this Project are summarized. Surveillance of the El Paso nautral gas producing wells near the Gasbuggy experiment was conducted to ensure that radioactive contaminated gas is not present. (Author)

SWRHL-100-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
ENVIRONMENTAL SURVEILLANCE FOR PROJECT GASBUGGY PRODUCTION TEST PHASE.

Jun 70, 39p PNE-G-63

Descriptors: (*Nuclear explosions, Radioactive contaminants), Underground explosions, Sampling, Tritium, Carbon 14, Krypton 85.
Identifiers: Plowshare operation, *Gasbuggy operation.

Production testing of the Gasbuggy Emplacement Re-entry well took place from November 4, 1968, to November 14, 1969. The Southwestern Radiological Health Laboratory of the Bureau of Radiological Health (BRH) conducted a program of radiological monitoring and environmental sampling to document levels of airborne and deposited radioactivity released to the off-site area during this period.

SWRHL-102-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
ANIMAL INVESTIGATION PROGRAM.
1969 Annual report.
D. D. Smith, and K. R. Giles. Aug 70, 27p

Descriptors: (*Nevada, *Radioactive contaminants), (*Cattle, Radioactive contaminants), (*Wildlife, Radioactive contaminants).

The radionuclide contents of selected bovine, deer, and Bighorn sheep tissues which were collected during 1969 from animals grazing on or near the Nevada Test Site are reported. The radionuclide burden remains low, with the highest levels and widest range reported from animals collected in May. The strontium content of bones collected from all three species continues the downward trend of recent years. Other activities of the Animal Investigation Program during 1969 are also mentioned. Tables are presented to show contents of 144Ce, 137Cs, 131I, 40K, 54Mn, 106Ru, 89Sr, and 90Sr. Author)

SWRHL-104-r
Southwestern Radiological Health Lab., Las Vegas.
AGRONOMIC ASPECTS OF THE EXPERIMENTAL DAIRY FARM DURING 1969,
Edgar M. Daley. Jul 71, 19p

Descriptors: (*Dairy cattle, *Radiological laboratories).

For abstract, see 73 01.

SWRHL-105-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
PROJECT GASBUGGY, OFF-SITE RADIOLOGICAL SAFETY REPORT.
Jul 70, 20p PNE-G-65

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Gasbuggy operation.

Off-site radiological surveillance was provided for the Gasbuggy-2 Redrill (GB-2R)-Phase 1 program. This surveillance was the continuation of the previous off-site surveillance program for Gasbuggy, and consisted of: operating a daily air sampling network; placing thermoluminescent dosimeters in a network around the site; monitoring for radioactivity; taking special air samples during flaring operations; and collecting water, vegetation, and soil samples after completion of testing operations. The only radioactivity above background levels detected off-site was in special air samples. These samples contained trititum concentrations above background; the concentrations found presented no hazard to and people or livestock living in the off-stie area. (Author)

SWRHL-106-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
SOIL SURVEY OF AREA 15 NEVADA TEST SITE,
Verr D. Leavitt, and Benjamin J. Mason. Jun 71, 46p

Descriptors: (*Nevada, *Soils).

The results of a soil survey of the area around the Environmental Protection Agency Experimental Dairy Farm located in Area 15of the U. S. Atomic Energy Commission's Nevada Test Site are reported. Four soil series were identified. Descriptions of these series are included along with physical and chemical analyses of representative samples of the soils. (Author)

SWRHL-107-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE BANEBERRY EVENT, DECEMBER 18, 1970.
Feb 72, 171p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Baneberry shot.

The Baneberry Event was an underground nuclear weapon test conducted at the Nevada Test Site on December 18, 1970. Shortly after the detonation, fission products escaped into the atmosphere, resulting in a release of radioactivity to the off-site area. A radiological monitoring program was used to detect radioactivity in environmental media in a widespread area of the western United States. (Author)

SWRHL-108-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JANUARY-JUNE 1970.

Aug 72, 68p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).

During the period January through June 1970, 24 announced underground nuclear tests were conducted by the U. S. Atomic Energy Commission at its Nevada Test Site. The Western Environmental Research Laboratory conducted an off-site surveillance program during this period. (Author)

SWRHL-110-r
Southwestern Radiological Health Lab., Las Vegas.
RADIONUCLIDE CONCENTRATIONS AND BOTANICAL COMPOSITION OF THE DIET OF CATTLE GRAZING THE AREA 18 RANGE OF THE NEVADA TEST SITE, 1966-1970,
D. D. Smith, K. W. Brown, R. A. Breckbill, K. R. Giles, and A. L. Lesperance. May 72, 38p

Descriptors: (*Cattle, *Radioactive contaminants).

The radionuclide content and botanical composition of the diet of the beef animals grazing on the Area 18 range of the Nevada Test Site was determined by analyzing rumen samples collected from fistulated steers. The content of 144Ce, 137Cs, 131I, 239Pu, 106Ru, 95Zr, and 85Zn in rumen samples was measured. Grass exceeded 80% of the diet of 23 out of 43 monthly samples. Squirrel tail grass, Sitanion hystrix and Indian rice grass, Orhyzopsis hymenoides, were the major components of this portion of the diet. At times during the summer months Russian thistle constituted over 30% of the total diet. (Author Modified Abstract)

SWRHL-111-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
REPORT OF THE RADIOLOGICAL CLEAN-UP OF BIKINI ATOLL.
Allan E. Smith, and William E. Moore. Jan 72, 45p

Descriptors: (*Bikini atoll, *Radioactive contaminants).

For abstract, see 75 01.

SWRHL-112-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
RADIONUCLIDE STUDIES IN DAIRY COWS FOLLOWING PROJECT SCHOONER.
Stuart C. Black, David N. McNelis, and Erich W. Bretthauer. Jan 72, 30p

Descriptors: (*Cattle, *Radioactive contaminants), (*Dairy cattle, *Radioactive isotopes).

Hay bales were placed 30 to 50 miles from surface ground zero in the predicted downwind direction of the effluent from Project Schooner, conducted December 8, 1968. Subsequent to contamination, the hay was recovered and fed to groups of dairy cows in a controlled ingestion experiment. As noted in similar experiments during the Cabriolet and Buggy cratering tests, the secretion of 131I in milk was below expectations. Concurrent measurements of 187W transfer indicated that less than 0.07% of the ingested tungsten was secreted in milk.

SWRHL-114-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
JANUARY 1971 SHEEP DEATH INCIDENT NEAR GARRISON, UTAH.
Nov 71, 11p

Descriptors: (*Sheep, *Utah).

For abstract, see 73 01.

SWRHL-117-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
AGRONOMIC ASPECTS OF THE EXPERIMENTAL DAIRY FARM, 1970,
Edgar M. Daley. Mar 72, 21p

Descriptors: (*Dairy cattle, *Radiological laboratories).

For abstract, see 73 01.

SWRHL-15-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE KIWI B4E EXPERIMENT.
25 Jan 65, 26p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants).
Identifiers: *Rocket reactors (Kiwi).

The Public Health Service provided off-site surveillance for the KIWI B4E full power reactor run conducted on August 28, 1964, and for a restart of the reactor on September 10, 1964. Small amounts of radioactive material were detected off site following both tests; however, in no instance did exposures exceed the radiological safety guides set forth in the AEC Manual, Chapter 0524. (Author)

SWRHL-16-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE NRX-A2 EXPERIMENT.

3 Feb 65, 24p

Descriptors: (*Nuclear reactors, *Radioactive contaminants).
Identifiers: *NRX reactor.

The Public Health Service provided off-site surveillance in support of the NRX-A2 reactor tests conducted on September 24 and October 15, 1964. This support consisted of tracking the effluent, monitoring radiation dosage to the off-site population, and collecting environmental samples (air, milk, water and vegetation). Analyses of these data indicate that no hazard was created to the off site population from the NRX-A2 tests. (Author)

SWRHL-17-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE KIWI TNT EXPERIMENT.

6 Aug 65, 24p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants).
Identifiers: *Rocket reactors (Kiwi).

The Southwestern Radiological Health Laboratory provided off-site radiation surveillance in support of the Kiwi Transient Nuclear Test (TNT) conducted on January 12, 1965. This support consisted of tracking the effluent, monitoring radiation dosage to the off-site population and collecting environmental samples in southern Nevada and California. Although off-site contamination occurred as a result of Kiwi TNT, the data collected indicate that radioactivity levels did not exceed radiation Protection Guides established by the Atomic Energy Commission for the off-site population. (Author)

SWRHL-18-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE NRX-A3 EXPERIMENT.

8 Oct 65, 31p

Descriptors: (*Nuclear reactors, *Radioactive contaminants).
Identifiers: *NRX reactor.

The Southwestern Radiological Health Laboratory provided off-site radiation surveillance in support of the NRX-A3 experiments of April 23, May 20, and May 28, 1965. This support consisted of tracking the effluent, monitoring radiation dosage to the off-site population and collecting environmental samples in downwind areas. Although off-site contamination occurred as a result of the NRX-A3 tests, the data collected indicate that radioactivity levels did not exceed the safety criteria established by the Atomic Energy Commission for the off-site population. (Author)

SWRHL-19-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE PHOEBUS 1-A EXPERIMENT.

17 Jan 66, 24p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants).
Identifiers: *Rocket reactors (Phoebus 1A).

The Southwestern Radiological Health Laboratory provided off-site radiation surveillance in support of the Phoebus 1-A Experiment of June 25, 1965. This support consisted of tracking the effluent, monitoring radiation dosage to the off-site population and collecting environmental samples in downwind areas. Although off-site contamination occurred as a result of the Phoebus test, the data collected indicate that radioactivity levels did not exceed the safety criteria established by the Atomic Energy Commission for the off-site population. (Author)

SWRHL-22-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JULY--DECEMBER 1964.

Dec 68, 43p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).

Off-site radiological surveillance for fifteen announced underground nuclear detonations and four reactor experiments during the period from July through December 1964, at the Nevada Test Site is described. This surveillance was conducted in the public areas surrounding the Nevada Test Site. Off-site radiological surveillance was also provided for an underground test conducted in Mississippi as part of the Vela Uniform program. During the six-month period two announced nuclear events and four reactor experiments released radioactivity which was detected off-site. No radioactivity was released following the Project Salmon detonation in Mississippi. Analysis of all sampling and surveillance performed during the six-month period indicates that the safety criteria established by the Atomic Energy Commission for the off-site population were not exceeded. (Author)

SWRHL-26-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
RADIOIODINE STUDIES FOLLOWING THE TRANSIENT NUCLEAR TEST (TNT) OF A KIWI REACTOR.
S. C. Black, D. S. Barth, R. E. Engel, and K. H. Falter. May 69, 92p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants), (*Iodine isotopes, Radioactive contaminants).
Identifiers: *Rocket reactors (Kiwi).

In conjunction with the Transient Nuclear Test of a Kiwi reactor, on January 12, 1965, hay contamination and controlled dairy cow ingestion studies for radioiodines were conducted. The studies were designed to simulate the maximum possible radioiodine uptake by dairy cows under winter dairy farming conditions, where radioiodines enter the cows via ingested, contaminated hay. The kinetics of the secretion of radioiodines in milk under the conditions of this experiment were determined.

SWRHL-27-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
STUDY OF A SINGLE DOSE 131I-126I RATIO IN DAIRY COWS.
W. Shimoda, S. C. Black, K. H. Falter, R. E. Engel, and D. S. Barth. Apr 70, 100p

Descriptors: (*Cattle, *Radioactive contaminants), (*Iodine isotopes, Cattle), (*Dairy cattle, *Radiobiology).

Four groups of two lactating holstein cows each were dosed in single ingestion experiment with four different combinations of 126I and 131I ranging from 0 to 20.1% 126I. Theoretical equations developed and experimental results indicate that it is possible to detect and quantitate 126I in the presence of 131I in milk samples by determining the physical half-life of the combined radioiodines from repetitive gama scans on the same samples, even though the individual gama energies of 126I and 131I cannot be resolved by the gama analysis system. Peak levels of the radioiodines in milk from all cows were observed at five hours (first milking) after oral ingestion of dose.

SWRHL-3-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR OPERATION DOMINIC II.
15 Jul 65, 51p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: Dominic 2 operation.

Operation Dominic II was a series of four nuclear tests conducted on the Nevada Test Site between July 7 and 17, 1962. This report concerns the program of off-site radiological surveillance conducted throughout Operation Dominic II by the U. S. Public Health Service (PHS) for the Atomic Energy Commission (AEC) in accordance with a Memorandum of Understanding between the two agencies. The field and laboratory methods and equipment used, the measurements made, and the results obtained from off-site surveillance of the four events are described. No cases of alleged radiation sickness or injury to people, livestock, or property developed during the operation. The results of surveillance presented in this report indicate that the safety criteria established by the AEC for the off-site population were not exceeded during Operation Dominic II. (Author)

SWRHL-30-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE NRX-A4/EST TEST SERIES.

19 Sep 66, 43p

Descriptors: (*Nuclear reactors, *Radioactive contaminants).
Identifiers: *Rover operation, *NRX reactor.

The off-site radiation surveillance for the NRX-A4/EST Project Rover Reactor test series which took place at NRDS test cell A is described. Of the six experimental plans in the test series, four resulted in detectable quantities of radioactivity in off-site areas. Although radioactive effluent was detected off-site from this event, the surveillance indicated that the radiation protection guides established by the Atomic Energy Commission (based on Federal Radiation Council guidelines), Chapter 0524, for the off-site population were not exceeded. The peak off-site potential thyroid exposure was about 36 milltrad at Lone Pine, California. (Author)

SWRHL-32-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE NRX-A5 TEST SERIES.

15 Oct 68, 45p

Descriptors: (*Nuclear reactors, *Radioactive contaminants).
Identifiers: *Rover operation, *NRX reactor.

The Southwestern Radiological Health Laboratory provided off-site radiological surveillance for the NRX-A5 Project Rover Reactor Test Series at NRDS, Test Cell A. During the period in which this series was conducted, there were four experimental plans (EP's) in the NRX-A5 series, two of which were full power runs (1100 Mw) of about 15 minutes duration which produced detectable amounts of radioactivity off-site. Radioactive effluent released by the EP-III on June 8, 1966, was detected by ground level surveillance in the southwest off-site quadrant. Effluent released by the EP-IV on June 23 was detected by ground level surveillance to the Utah-Nevada border, about 190 miles from the Test Cell. Although off-site contamination occurred from the NRX-A5 test series, surveillance indicated that radioactivity levels did not exceed the radiation protection guides.

SWRHL-33-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
THE POISONOUS PLANTS OF THE U.S. ATOMIC ENERGY COMMISSION'S NEVADA TEST SITE, NYE COUNTY, NEVADA.
Kenneth W. Brown, and Donald D. Smith. 22 Dec 66, 74p

Descriptors: (*Nevada, *Poisonous plants).

A list is presented of the poisonous plant species found at the Nevada Test Site. The plants are cataloged according to family, genus, and species. Each species is described, its distribution and habitat given, and the poisonous principle involved is discussed. Symptomatology, pathology, treatment, and prevention in relation to the plant's toxicity are also discussed. (E.R.B)

SWRHL-34-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
CALCIUM IN HOCK JOINTS OF WILDLIFE RUMINANTS IN SELECTED AREAS OF THE UNITED STATES.
Raymond A. Brechbill, Ronald E. Engel, and Robert C. Kramp. 21 Jul 67, 15p

Descriptors: (*Ruminants, *Calcium).

The percent calcium of both ash found in hock joints of 63 mule deer (Odocoileus hemionus), 14 white-tailed deer (Odocoileus virginanus), 14 elk (Cervus canadensis), 13 desert bighorn sheep (Ovis canadensis nelsoni), nine antelope (Antilocarpa americana), and seven buffalo (Bison bison) is reported. The average calcium content of hock joints in the six species from 18 different areas throughout the United States was 37.6% of bone ash. Differences between species, regardless of geographic locations, were small when present. (Author)

SWRHL-36-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
STATUS OF THE NEVADA TEST SITE EXPERIMENTAL FARM.
Summary report, July 1964-December 1965.
Richard L. Douglas. 17 Jan 67, 33p

Descriptors: (*Cattle, *Radioactive contaminents), (*Iodine Isotopes, Cattle), (*Dairy cattle, *Radiobiology).

An experimental farm facility was required to determine the passage of 131I through air-forage-dairy cow-milk-man food chain. The following aspects of the experimental farm facility are described: specific site characteristics, cultivated area, well and reservoir, irrigation system, other agricultural equipment, laboratory and animal facilities, and permanent research and support equipment. Agronomy practices are discussed with regard to irrigation, crops, and fertilization. One experiment, Project Hayseed, was performed. An aerosol tagged with 131I was released over Sudan grass. The grass was cut and fed to groups of lactating cows.

SWRHL-37-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JANUARY THROUGH JUNE 1966.
Jan 70, 93p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).

Off-site radiological surveillance was performed for twentynine announced events and nine reactor experiments at the Nevada Test Site during the period from January through June 1966. During the six month period, three announced nuclear events and six reactor experiments released radioactivity which was detected off-site. Analysis of all sampling and surveillance performed during the six month period indicates that the safety criteria established by the Atomic Energy Commission for the off-site population were not exceeded.

SWRHL-38-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JULY THROUGH DECEMBER 1966.
Dec 68, 20p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).

The Southwestern Radiological Health Laboratory of the Public Health Service performed off-site radiological surveillance for ten announced events during the period from July through December 1966. This surveillance is conducted in the public areas surrounding the Nevada Test Site under a Memorandum of Understanding with the U.S. Atomic Energy Commission. No reactor experiments were conducted during this time. During the six-months period there was one event, Derringer,

conducted on September 12, 1966, which released radioactive effluent that was detected only in an unpopulated location off the Nevada Test Site. Also during this period an underground test, Project Sterling, was conducted in Mississippi on December 3, 1966 as part of the Vela Uniform program. No radioactivity attributable to this detonation was detected in the off-site area.

SWRHL-39-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
131I DAIRY COW UPTAKE STUDIES USING A SUBMICROMETER SYNTHETIC DRY AEROSOL (PROJECT SIP).
Benjamin J. Mason, Stuart C. Black, and Delbert S. Barth. Mar 71, 31p

Descriptors: (*Cattle, *Radioactive contaminants), (*Iodine isotopes, Cattle), (*Dairy cattle, *Radiobiology).
Identifiers: *Sip Operation.

The mechanisms associated with the overall transfer of 131I from the environment to cow's milk were studied following the controlled release of a simulated fallout. A 131 I-labelled aerosol of submicrometer size was released over a pasture and a corral containing 18 dairy cows. Six of the cows had hay in mangers for their consumption. Another group of six was fed green chop from the contaminated pasture, while the remaining six cows received no other contaminated material. The pasture was contaminated to a level of 1.13 micro Ci/kg, and cows fed green chop from the pasture secreted a peak level of .07 micro Ci/liter in milk. The effects of feeding practices on the passage of 131I through the atmosphere-forage-cow-milk-man food chain were evaluated. (Author Modified Abstract)

SWRHL-4-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR OPERATION STORAX.

20 Jul 65, 63p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Storax operation.

The methods used and the results obtained from off-site surveillance conducted during Operation Storax, July 1, 1962 to June 30, 1963, by the Southwestern Radiological Health Laboratory, Las Vegas, Nevada for the Atomic Energy Commission (AEC) are described. Analysis of the results obtained from various environmental sampling programs indicates that the safety criteria established by the AEC for the off-site population were not exceeded as a result of any one or combination of events of Operation Storax. (Author)

SWRHL-40-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
PASTURE AND GREEN CHOP FEEDING PRACTICES IN NEVADA WITHIN 300 MILES OF PAHUTE MESA IN THE 0 - 60 DEG TRAJECTORY.

1968, 13p

Descriptors: (*Dairy cattle, *Feeding habits).

Feeding practices for milk cows within a specific trajectory in the State of Nevada are presented. Graphs show that the number of cows fed on pasture increases rapidly during the month of April and decreases sharply during October. Also included is information on milk production and distribution in Nevada and Utah. (Author)

SWRHL-41-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
DAIRY FARM RADIOIODINE STUDIES FOLLOWING THE PIN STRIPE EVENT OF APRIL 25, 1966.
D. S. Barth, R. E. Engel, S. C. Black, and W. Shimoda. Jul 69, 72p

Descriptors: (*Cattle, *Radioactive contaminants), (*Iodine, Cattle), (*Dairy cattle, *Radiobiology).
Identifiers: *Pin Stripe shot.

A study was mounted at two dairy farms following the inadvertent release of radioactivity from the site of an underground nuclear test (Pin Stripe) conducted at the Nevada Test Site on April 25, 1966. The study produced some results which were similar to those found after the inadvertent release following the Pike event. At the two study farms the effective half-life of 131I was found to be 4.9 and 4.0 days for field forage while the green chop collected from the cow mangers had effective half-lives of 6.9 and 6.7 days, respectively. In the same order, the effective half-lives of 131I in milk from cows eating the green chop were 5.6 and 4.0 days. The milk-to-forage ratios (pCi/liter divided by pCi/kg) were 0.086 and 0.078, respectively,. In one of the herds, uncontaminated hay was substituted for contaminated fresh forage after the third day. Over an eighteen day period this countermeasure reduced the potential thyroid dose of humans consuming one liter of the milk per day to only 29% of the dose which would have resulted had no countermeasure been applied. (Author)

SWRHL-42-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
131 DAIRY COW STUDIES USING A DRY AEROSOL (PROJECT ALFALFA),
Richard E. Stanley, Stuart C. Black, and Delbert S. Barth. Aug 69, 75p

Descriptors: (*Cattle, *Radioactive contaminants), (*Iodine isotopes, Cattle), (*Dairy cattle, *Radiobiology).
Identifiers: *Alfalfa operation.

The report covers the second controlled release conducted by the Bioenvironmental Research Program to define the mechanisms associated with the transfer of 131I from the environment to cow's milk. Growing alfalfa-oats, hay, and spread green chop were contaminated with a diatomaceous earth aerosol labelled with 131I. Three groups of dairy cows were fed the three types of contaminated forage. One other group of dairy cows was exposed directly to the aerosol for an air uptake study. The smaller particle size of the aerosol used in this study (2 micrometers) resulted in higher milk-to-forage ratios than were observed in the first study where the particle size was 23 micrometers. These ratios of peak average milk to peak average forage activities were 0.061 for the hay, 0.036 for the green chop, and 0.032 for the growing alfalfa-oats. (Author)

SWRHL-43-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
TRANSPORT THROUGH THE AIR-FORAGE-COW-MILK SYSTEM USING AN AEROSOL MIST (PROJECT RAINOUT).
Richard L. Douglas, Stuart C. Black, and Delbert S. Barth. Jun 71, 38p

Descriptors: (*Cattle, *Radioactive contaminants), (*Iodine isotopes, Cattle), (*Dairy cattle, *Radiobiology).
Identifiers: *Rainout operation.

Project Rainout was an experiment conducted to determine the transfer of 131I from forage to dairy cow milk when the radioiodine was sprayed on the forage as an aqueous solution. Growing alfalfa, cut as green chop, and spread hay were used as forage. The peak activity in milk from cows consuming both types of forage occurred about one day after the start of feeding. The peak milk-to-peak forage ratio was 0.013 for the cows fed hay and 0.041 for the cows fed green chop. The hay fed cows secreted in milk an average of 4.5% of the amount of 131I they ingested, while the green chop fed cows secreted 6.1%. (Author)

SWRHL-45-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE PHOEBUS IB, EP-I, EP-II, EP-III, EP-IV REACTOR TEST SERIES.

Jul 69, 30p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants).
Identifiers: *Rover operation, *Rocket reactors (Phoebus 1B).

The Phoebus 1B reactor test series consisted of three calibration operations and a full power run. Effluent from the Experimental Plan III (EP-III) operation was detected off-site by one ground monitor and by the presence of 29 pCi/cu m 139 Ba on a prefilter from a portable air sampler operating at an unpopulated location on Highway 95 in Nevada. Effluent from the Experimental Plan IV (EP-IV) operation was detected in air, milk, and vegetation samples and by portable and fixed radiac instruments in Nevada and Utah. The maximum concentration of 131I in milk was 63 pCi/l at the Martin Ranch southwest of Eureka, Nevada. No fresh fission products were found in water samples. In addition to the usual gaseous effluent from a reactor operation, the EP-IV operation resulted in the release of discrete particles of material that were found downwind as far as 80 miles from Test Cell 'C'. Only one particle was found beyond the Test Range Complex.

SWRHL-46-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
PARTICULATE EFFLUENT STUDY. PHOEBUS 1B, EP-IV.

Apr 70, 53p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants).
Identifiers: *Rover operation, *Rocket reactors (Phoebus 1B).

A study concerned with delineating the physical and chemical characteristics and possible hazards associated with release of particulate matter (greater than several microns in diameter) from the Phoebus IB, EP-IV reactor run conducted February 23, 1967, was conducted. The reactor test was part of the Project Rover Program and was conducted at Jackass Flats, Nevada. (Author)

SWRHL-47-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JANUARY THROUGH JUNE 1967.

Mar 70, 121p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).

The Southwestern Radiological Health Laboratory of the Public Health Service performed off-site radiological surveillance for 16 announced events and one reactor experiment during January through June 1967. This surveillance was conducted in the public areas surrounding the Nevada

Test Site under a Memorandum of Understanding with the U. S. Atomic Commission. During the six-month period, two announced nuclear events and two Experimental Plans of the Phoebus 1B reactor test series released radioactivity that was detected off-site.

SWRHL-50-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
NIMBUS B/SNAP 10 LAUNCH: MAY 18, 1968. OFF SITE RADIOLOGICAL SURVEILLANCE.
Dec 68, 37p

Descriptors: (*Rocket launching, *Radioactive contaminants).

The off-site area near Vandenburg Air Force Base was monitored during and after the unsuccessful launch of the Nimbus-B/SNAP-19 satellite. A variety of environmental samples was collected from the mainland, sea, and channel islands and was compared to previous data from the area. During the recovery operations, additional samples were taken. No increase in environmental radioactivity levels was observed from this operation. (Author)

SWRHL-500-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
SEPARATION TECHNIQUE FOR THE DETERMINATION OF 85KR IN THE ENVIRONMENT,
D. L. Stevenson, and F. B. Johns. 1969, 11p CONF-710705

Descriptors: (*Krypton 85, *Gas analysis), (*Radioactive isotopes, *Gas analysis).

A carrier-free chromatographic method for separating krypton from an atmospheric sample is described. The krypton is then dissolved and counted in liquid scintillation solution. The method is compartively simple, reproducible, and sensitive enough to routinely detect environmental levels of 85Kr.

SWRHL-501-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
ENVIRONMENTAL MONITORING SYSTEM FOR NUCLEAR TESTS,
Melvin W. Carter, Donald T. Wruble, and Richard E. Jaquish. Apr 71, 21p CONF-710705-3

Descriptors: (*Radioactive contaminants, *Environmental surveys).

The report describes the extensive environmental monitoring system maintained by the Western Environmental Research Laboratory for nuclear testing programs in the United States. It is designed to produce comprehensive information and data on radioactive contamination and exposures as quickly as possible. This is accomplished through use of aircraft and mobile ground monitoring temas that can make radiation measurements and collect a variety of environmental samples, followed by specially designed laboratory analytical procedures and data processing to expedite data acquisition. The system can thereby provide rapid assessment of radioactive releases that may affect a large segment of the population within the western United States.

SWRHL-502-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
DATA ACQUISITION AND ANALYSIS SYSTEM FOR EMERGENCY ENVIRONMENTAL SURVEILLANCE,
R. N. Snelling. Mar 71, 30p CONF-710705-4

Descriptors: (*Radioactive contaminants, *Environmental surveys).

A computer-based system for the rapid analysis of large numbers of environmental samples is described. The functional breakdown of the system includes sample control, gamma analysis, air sample analysis, chemistry data analysis, and data management.

SWRHL-503-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
WHOLE-BODY COUNT OF 137W IN PHS PERSONNEL FOLLOWING THE SCHOONER EVENT,
John A. Eckert. 1971, 18p CONF-711104-2

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Schooner shot.

The SCHOONER Event, conducted at the Nevada Test Site, December 8, 1968, released radioactive effluent into the environment. Whole-body counts were performed on thirty one Public Health Service personnel who participated in this cratering experiment. Tungsten-187 appeared in the resultant spectra as the only contaminant. Repeated whole-body counts were performed during the week following exposure to determine the magnitude of individual burdens. The maximum burden measured, 25 micro Ci, correlates to an estimated dose to the large intestine of approximately 1 rad. A whole-body scan performed eight hours after exposure confirmed the presence of tungsten-187 in the GI tract of one individual.

SWRHL-51-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE FAULTLESS EVENT, JANUARY 19, 1968.

Apr 69, 13p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Faultless shot.

A final summary is presented of the pre-shot, shot-day, and post-shot activities for the Faultless Event on January 19, 1968 in Nevada. The pre-shot activities included milk and water sampling, air sampling and dosimetry, establishment of community information centers, education of the public in surrounding areas to possible disturbances, and provision of medical and veterinary services. The event day activities included aerial and ground monitoring, establishment of road blocks, and evacuation of people to beyond the shot-range boundaries.

SWRHL-52
Southwestern Radiological Health Lab., Las Vegas, Nev.
RANGE SURVEY, AREA 18, NEVADA TEST SITE.
Benjamin J. Mason, and Kenneth W. Brown. Dec 68, 42p

Descriptors: (*Nevada, *Plants (Botany)).

The ocular reconnaissance method of surveying vegetation was used to survey 13,630 acres in Area 18 Nevada Test Site. A total of 233 line transects were established to obtain species distribution, composition, and ground cover. There were six distinct plant communities identified: two sagebrush (Artemisia arbuscuia subsp. nova, A. tridentata), two annual (Salsola kali var. tenuifolia, Eriogonum), one grass, and one Desert Shrub. These six communities contained a total of 36 families and 85 species. The A. arbuscula subsp. nova community occupied the largest area, 6,337 acres, and the Eriogonum community the smallest, 17 acres. (Author)

SWRHL-53-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
SPECIAL BOVINE SAMPLING STUDY: PROJECT ROLLERCOASTER SITES,
Raymond A. Brechbill. Jun 69, 23p

Descriptors: (*Cattle, *Radioactive contaminants), (*Nuclear explosions, Radioactive contaminants).
Identifiers: *Rollercoaster operation.

Six bovine, three young animals and three aged animals, that were grazing on or near the 1963 Project Rollercoaster sites were sacrificed in April 1967 to assess the body burden of 239 Pu in these animals. Levels found in various tissues were higher than those found in bovine grazing on the NTS but far below the MPC levels established for humans. The maximum dose an individual could receive from consuming tissue from these animals is negligible. No pathology was found on either gross or microscopic examination that could be directly related to radiation. Due to the obscure etiology of the described lesions, it would be impossible to reach any definte conclusions as to their origin; but it would appear to be due to some other cause than radiation, since the body burden of 239 Pu was well below those levels known to induce detectable radiation damage. No statisical difference was found in the levels of 239 Pu between the young and aged animals. Hilaria jamesii constituted 86% of the animals' diet. (Author)

SWRHL-54-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
ANIMAL INVESTIGATION PROGRAM BASELINE STUDIES: SUPPLEMENTAL TEST SITE 'C'.
Bruce P. Hull, Jr., and Stanley L. Cohen. 13 Sep 68, 18p

Descriptors: (*Cattle, *Radioactivity), (*Deer, Radioactivity).
Identifiers: *Baseline measurements.

Tissue samples from two male deer and three beef cattle from the proposed Supplemental Test Site in Nevada were collected for radioanalysis and histopathologic studies prior to the Faultless event. Pathologic lesions present and detectable body burdens of selected radioisotopes were comparable to those found in routine sacrifices. (Author)

SWRHL-55-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
PROGRESS REPORT FOR THE BIOENVIRONMENTAL RESEARCH, MAY 22, 1964--JULY 1, 1966. PART I. EXPERIMENTAL DAIRY HERD.
Donald D. Smith, and Ronald E. Engel. Mar 69, 106p

Descriptors: (*Cattle, *Radioactive contaminants), (*Dairy cattle, *Radiobiology).

Environmental surveys were made at stations where there was a reasonable probability that radioactivity would be released to the atmosphere from nuclear tests. Dairy-cow facilities, dairy-cow husbandry, veterinary medicine, and experiments using dairy cows are described.

SWRHL-56-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
PROTECTIVE ACTION TAKEN AT SCHOFIELD'S DAIRY HIKO, NEVADA FOLLOWING AN ACCIDENTAL RELEASE OF RADIOACTIVITY FROM THE NEVADA TEST SITE.
John S. Coogan, and Wayne A. Bliss. Jan 72, 9p

Descriptors: (*Cattle, *Radioactive contaminants), (*Iodine isotopes, Cattle), (*Dairy cattle, *Radiobiology).

A protective measure applied to decrease radioiodines in a dairy's milk production and the factors judged in choosing the mode of action are defined. On April 25, 1966, an underground nuclear test conducted at the Nevada Test Site released radioactivity to the atmosphere. Four cows were fed a regular diet of green chop and grain as a control to assess the effect of protective action. The 131I levels in their milk decreased only about 10% per day. Protective action consisted of feeding the remaining cows dry hay and grain. It was estimated that this action reduced the 131I thyroid dose by 71%.

SWRHL-58-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
ENVIRONMENTAL MONITORING WITH THE THERMOLUMINESCENT DOSIMETERS. AN EVALUATION OF THE SYSTEM AND A COMPARISON TO PHOTOGRAPHIC METHODS.
Chas. K. Fitzsimmons, and William H. Horn. Oct 69, 25p

Descriptors: (*Luminescent dosimeters, Performance evaluation), Gamma rays, Comparisons, Thermoluminescence.

In August 1965, the Southwestern Radiological Health Laboratory put into operation a thermoluminescent dosimeter (TLD) system for monitoring gamma radiation exposure in the environment surrounding the Nevada Test Site. A description of the equipment and calibration technique is given. Precision of TLD results at the 95% confidence level has been found. Actual field data ranging from background levels to about 1 R show TLD's to be more satisfactory than film badges for the particular applications described. (Author)

SWRHL-59-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE PIN STRIPE EVENT, APRIL 25, 1966.
Feb 72, 78p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Pin Stripe shot.

The Public Health Service provided off-site surveillance in support of the Pin Stripe Event conducted on April 25, 1966, at the Nevada Test Site. This support consisted of tracking the effluent, monitoring radiation dosage to the off-site population, collecting and analyzing environmental samples of air, milk, water and vegetation, and conducting an intensive public relations program for the off-site residents.

SWRHL-6-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE FOR PROJECT LONGSHOT.
Final report.

Dec 68, 8p

Descriptors: (*Nuclear explosions, *Radioactive contaminants), (*Amchitka Island, Nuclear explosions).
Identifiers: Longshot operation.

The program of radiation monitoring and environmental sampling conducted in conjunction with Project Longshot, an underground nuclear experiment which took place on Amchitka Island in the Aleutian Chain, on October 29, 1965, is described and the results tabulated. It was concluded that all radioactivity was completely contained during Project Longshot, and that the experiment produced no radioactive exposure of any off-site resident.

SWRHL-60-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
PARTICULATE EFFLUENT STUDY. PHOEBUS 2A: EP-IV AND EP-V.

Jun 69, 62p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants).
Identifiers: *Rover operation, *Rocket reactors (Phoebus 2A).

The Phoebus 2A Experimental Plans IV and V were full-power nuclear reactor operations conducted as part of Project Rover. Large effluent particles of high activity were studied for particle depostion concentration at various distances, gross physical characteristics, chemical composition, and gross and specific radioactivity. Survey results indicated wide spread deposition for Plan IV with no defined hotline. The particles were porous and fragile and had a metallic black appearance. The use of a latex spray reduced the shattering of particles during collection and separation. The chemical composition of the particles was primarily uranium oxides. Fall velocity was determined. The primary radioisotopes found by gamma spectroscopy were those of Sr, Zr, Ru, I, Ba, Mo, and Ce. (Author Modified Abstract)

SWRHL-62-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
SUMMARY OF NECROPSY FINDINGS IN DESERT BIGHORN SHEEP.
Jack B. Helvie, and Donald D. Smith. Nov 71, 16p

Descriptors: (*Pathology, *Sheep), (*Veterinary medicine, Sheep).

For abstract, see 73 01.

SWRHL-63-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
AGRONOMIC ASPECTS OF THE EXPERIMENTAL DAIRY FARM, JANUARY 1966--DECEMBER 1968.
E. M. Daley, and D. D. Smith. Aug 69, 41p

Descriptors: (*Cattle, *Radioactive contaminants), (*Iodine isotopes, Cattle), (*Dairy cattle, *Radiobiology).

An experimental form facility was established on the Nevada Test Site to study the transport of radioiodine through the atmosphere-forage-cow-milk-man-chain. The facility and agronomic procedures practiced are described. (Author Modified Abstract)

SWRHL-64-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JULY THROUGH DECEMBER 1967.
May 70, 88p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Gasbuggy operation.

The Southwestern Radiological Health Laboratory of the Public Health Service performed off-site radiological surveillance for twelve announced events and one reactor experiment during the period from July through December 1967. This surveillance was conducted in the public areas surrounding the Nevada Test Site (NTS). Off-site radiological surveillance was provided for Project Gasbuggy, an underground gas stimulation project conducted in New Mexico on December 10, 1967. During the six-month period, one announced nuclear event, the Door Mist Event, and one experimental plan, EP-IIIA, of the NRX-A6 reactor test series released radioactivity which was detected off-site.

SWRHL-65-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
PRELIMINARY RADIATION SURVEILLANCE OF AN AQUATIC SYSTEM NEAR THE NEVADA TEST SITE, JUNE-JULY 1967.
William L. Klein, and Raymond A. Brechbill. Feb 72, 27p

Descriptors: (*Pahranagat Lake, *Radioactive contaminants).

Results of a three-month preliminary radiation surveillance study of an aquatic system in Upper Pahranagat Lake near the Nevada Test Site are presented. The study was conducted to determine the concentrations of fission products in selected samples and to establish the necessary methodology for radiation surveillance in an aquatic ecosystem. Radionuclide concentrations were found to be insignificant in water, aquatic plant, and fish samples. sediment samples had detectable levels of 137Cs, 40K, 90Sr, and U.

SWRHL-67-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
STATUS OF THE BIOENVIRONMENTAL RESEARCH EXPERIMENTAL DAIRY HERD, JULY 1, 1966-DECEMBER 31, 1968.
Donald D. Smith. Jul 70, 93p

Descriptors: (*Cattle, *Radioactive contaminants), (*Iodine isotopes, Cattle), (*Dairy cattles, *Radiobiology).

A status report of the Experimental Dairy for the period July 1, 1966 through December 31, 1968 is presented. It lists changes and improvements made on the facilities; presents production and reproduction statistics; details cow and herd health problems and treatments; summarizes 131I experiments utilizing the dairy herd. (Author)

SWRHL-7-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE KIWI B4D EXPERIMENT.
23 Jul 64, 22p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants).
Identifiers: *Rocket reactors (Kiwi).

The Public Health Service provided off-site surveillance in support of the KIWI B4D reactor tests conducted on May 8 and May 13, 1964. This support consisted of tracking the effluent, monitoring radiation dosage to the off-site population, and collecting environmental samples (air, milk, and water). The data collected indicate that no hazard to the off-site population was created as a result of the KIWI tests. (Author)

SWRHL-71-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE RADIOLOGICAL SURVEILLANCE, NIMBUS B-2/SNAP-19 LAUNCH, APRIL 13, 1969.

Dec 71, 9p

Descriptors: (*Rocket launching, *Radioactive contaminants).

For abstract, see 73 01.

SWRHL-72-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF ENVIRONMENTAL SURVEILLANCE FOR PHOEBUS 2A REACTOR TEST SERIES, MAY-JULY 1968.
Oct 70, 54p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants).
Identifiers: *Rover operation, *Rocket reactors (Phoebus 2A).

During the months of May through July 1968, the Phoebus 2A nuclear reactor (5000 MW design-power) was tested through five Experimental Plans (EP's) at Test Cell C, Nuclear Rocket Development Station. For these tests the Southwestern Radiological Health Laboratory conducted radiological monitoring and environmental sampling in off-site areas surrounding the Test Range Complex. (Author)

SWRHL-74-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
SOIL SURVEY OF AREA 18, NEVADA TEST SITE,
V. D. Leavitt. Jul 70, 119p

Descriptors: (*Grazing land, *Radioactive contaminants).

This soil survey of Area 18 of the Nevada Test Site was conducted to gather information on the soil and vegetation of the Area 18 grazing range of the Atomic Energy Commission's (AEC) beef herd. Physical and chemical analyses were performed on the soils. Twenty soil series descriptions were written for the different types of soils. Soil maps are included. (Author)

SWRHL-75-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
AEROSOL PREPARATION, GENERATION, PROJECT HARE,
R. H. James, D. N. McNelis, E. L. Whittaker, and N. C. Kennedy. Feb 70, 22p

Descriptors: (*Radioactive contaminants, Environmental surveys).
Identifiers: *Hare operation.

Project Hare was the sixth in a series of experiments in which a radioactive contaminant was released under controlled conditions to simulate the passage of a nuclear event-related radioactive cloud. The history of the radionuclide from the nuclear event to a constituent of man's diet was studied as a function of the interrelated physical, chemical, and biological variables. The measurement of some of the physical and chemical parameters involved in the preparation, generation, and assessment of the aerosol is reported. (Author)

SWRHL-78-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE NRX-A6 REACTOR TESTS SERIES.

Aug 71, 46p

Descriptors: (*Nuclear reactors, *Radioactive contaminants).
Identifiers: *NRX reactor, *Rocket reactors (NERVA).

The NRX-A6 reactor test was a 60 minute full-power test under the NERVA program. The test was conducted at the Nuclear Rocket Development Station, Jackass Flats, Nevada, on December 15, 1967. The off-site radiological monitoring procedures used and the data obtained are summarized.

SWRHL-8-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
METHOD FOR POSITIVE COLLECTION OF IODINE FROM AIRBORNE CARBON-IODINE BONDED COMPOUNDS,
E. L. Whittaker, E. W. Bretthauer, R. J. Griffin, T. E. Worford, and R. D. Rawson. 26 Jun 64, 10p

Descriptors: (*Iodine organic compounds, *Gas analysis).

A method for quantitative collection of iodine from carbon-iodine bonded compounds is described. This method utilizes a high frequency electric spark to rupture the carbon-iodine bond followed by collection of the resultant ionic and molecular iodine forms on ion-exchange resin. (Author)

SWRHL-80-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
MANAGEMENT HISTORY OF THE AEC BEEF HERD, 1 JUNE 1964-1 JUNE 1969,
Donald D. Smith. Mar 70, 29p

Descriptors: (*Cattle, *Radioactive contaminants).

From June 1, 1964 to June 1, 1969, the Atomic Energy Commission's (AEC) beef herd has been maintained on the Nevada Test Site (NTS) by the Public Health Service's Southwestern Radiological Health Laboratory (SWRHL). The herd is used to determine the uptake and retention of various radionuclides and to provide background information regarding various inquiries and possible legal claims from off-site ranchers. The history, animal husbandry, production, and sampling program for the herd during the last five years are reviewed. Data are presented on the content of various radioisotpes in selected tissue samples and their relation to plant species ingested during grazing.

SWRHL-81-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JANUARY THROUGH JUNE 1968.
Jan 72, 107p

Descriptors: (*Nuclear explosions, *Radioactive contaminants), (*Nuclear rocket engines, *Radioactive contaminants).

During the period January through June 1968, eighteen announced nuclear tests were conducted in Nevada by the U. S. Atomic Energy Commission. Of these eighteen tests, three released radioactivity to the off-site environment. In addition, two operations of the Phoebus 2A nuclear rocket engine at the Nuclear Rocket Development Station released radioactivity that was detected off-site. The Southwestern Radiological Health Laboratory performed off-site radiological surveillance for the above events under a Memorandum of Understanding with the Atomic Energy Commission. (Author)

SWRHL-83-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JULY-DECEMBER 1968.
May 71, 121p

Descriptors: (*Nuclear explosions, *Radioactive contaminants), (*Nuclear rocket engines, *Radioactive contaminants).

During the period July through December 1968, fourteen announced underground nuclear tests were conducted at the Nevada Test Site. None of these events released radioactivity to the off-site environment. In December 1968 a Plowshare cratering experiment, Schooner, released radioactivity that was detected off-site. In addition, one operation of the Phoebus 2A nuclear rocket engine and one operation of the Pewee 1 nuclear rocket engine and one operation of the Pewee 1 nuclear rocket engine, at the Nuclear Rocket Development Station, released radioactivity that was detected off-site. (Author)

SWRHL-85-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
RADIONUCLIDE STUDIES WITH DAIRY COWS FOLLOWING TWO PLOWSHARE EXPERIMENTS,
Stuart C. Black, Erich W. Bretthauer, and David N. McNelis. Sep 71, 32p

Descriptors: (*Radioactive contaminants, *Cattle), (*Iodine isotopes, Cattle), (*Dairy cattle, *Radioactive isotopes).
Identifiers: *Plowshare operation.

Baled hay was placed on the ground in the predicted trajectory of the effluent from the two Plowshare cratering tests, Cabriolet and Buggy. After contamination, the bales were collected and measured amounts of the hay were fed to groups of dairy cows. As compared to similar experiments following other cratering tests, the amount of 131I transferred to milk was about one-third, and the time to peak milk concentration and effective half-life in milk were longer. The ratio of peak 131I concentration in milk to the peak concentration in hay was also much less than that observed in previous tests. These facts suggest that the 131I in the debris from these two tests was less biologically available to the cow than it was in previous tests. For Project Buggy, the transfer of 187W to milk was also measured.

SWRHL-87-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
ENVIRONMENTAL SURVEILLANCE FOR PEWEE 1, EXPERIMENTAL PLANS II AND III, NOVEMBER 21 AND DECEMBER 4, 1968.

Sep 71, 33p

Descriptors: (*Nuclear rocket engines, *Radioactive contaminants).
Identifiers: *Rover operation, *Rocket reactor (PEWEE).

Radiological monitoring and sampling were conducted in off-site areas after the testing of the Pewee 1 reactor through Experimental Plans (EP's) II and III, conducted on November 21 and December 4, respectively, at Test Cell C, Nuclear Rocket Development Station. No radioactivity was released during Experimental Plan I. The radioactive effluent from EP III was found by aircraft and off-site surveillance to have moved east-southeast from the test area as far as northwestern New Mexico. Air samples which contained reactor-related radioactivity were collected in southeastern Nevada, southern Utah, southwestern Colorado, northern Arizona, and northwestern New Mexico. Emissions from reactor pulse-cool-down operations and possibly portions of the main reactor cloud transported south by the evening drainage winds were also detected by air samplers located in southeastern California and Nevada.

SWRHL-90-r
Southwestern Radiological Health Lab., Las Vegas, Nev.

PLANT RADIODINE RELATIONSHIPS: A REVIEW,
James C. McFarlane, and Benjamin J. Mason. Jul 70, 53p

Descriptors: (*Plants (Botany), *Iodine isotopes), (*Radioactive contaminates, Plants (Botany)), Fallout.

The term deposition velocity has been widely used to describe iodine contamination of plants. The physics of iodine transfer from air to plants is described. It is a complex problem involving both chemistry and physics of the fallout, various forces that cause movement of the particles in the atmosphere, and the behavior and extent of the boundary layer that surrounds each leaf surface. (Author Modified Abstract)

SWRHL-92-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
SUMMARY OF HYPOTHETICAL WHOLE-BODY GAMMA EXPOSURES AND INFANT THYROID DOSES RESULTING OFF-SITE FROM PROJECT ROVER NUCLEAR REACTOR/ENGINE TESTS AT THE NUCLEAR ROCKET DEVELOPMENT STATION,
R. F. Grossman. Aug 70, 19p

Descriptors: (*Nuclear rocket engines, *Radiation dosage), Whole body irradiation.
Identifiers: *Rover operation.

From 1959 through 1969, thirty-one nuclear reactor engine tests, conducted at the Nuclear Rocket Development Station (NRDS) as part of Project Rover, released airborne radioactivity which was detected in the area surrounding the Test Range Complex (NRDS, Nevada Test Site, Tonopah Test Range, and Nellis Air Force Range). For these tests the Southwestern Radiological Health Laboratory (SWRHL) performed radiological monitoring and sampling. From the radiation exposure information reported by SWRHL, whole-body gamma exposures and infant thyroid doses were postulated for hypothetical receptors and summarized by year and sector from NRDS. A comparison of the Radiation Protection Standards of AEC Manual Chapter 0524 with this summary indicated that for each year of testing, the off-site whole-body exposures and infant thyroid doses were below 12% and 14%, respectively, of the Radiation Protection Standards for a population sample. (Author)

SWRHL-93-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
COMPARISON OF FILM BADGES AND THERMOLUMINESCENT DOSIMETERS USED FOR ENVIRONMENTAL MONITORING,
Charles K. Fitzsimmons, William Horn, and William L. Klein. May 72, 35p

Descriptors: (*Luminescent dosimeters, Comparisons), Thermoluminescence.

Data obtained from two concurrent dosimetry networks operated by the Western Environmental Research Laboratory in Nevada, one utilizing fim badges and the other, thermoluminescent dosimeters (TLD's), are compared. Gamma exposures from a few mR to approximately 1 R, due to both natural background and fission products in the environment, are more easily and accurately measured by the TLD system. The insensitivity of TLD's to environmental heating, humidity, light damage, and pressure makes them ideal for use in the extreme conditions encountered in the desert. Heat damage to the film was seasonal with the greatest losses occurring in the summer.

SWRHL-94-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE RADIOLOGICAL SAFETY AND RESIDENT EVACUATION PROGRAM FOR PROJECT RULISON.
Detonation Phase.
Jan 70, 69p PNE-R-14

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Rulison operation, Plowshare operation.

Project Rulison is the second jointly-sponsored government-industry nuclear experiment performed to determine the feasibility of using nuclear explosives to stimulate production and recovery of natural gas from low permeability gas-bearing formations. The operational procedures and results of the off-site radiological safety and resident evacuation programs conducted for the detonation phase of the experiment by the Public Health Service (PHS), Southwestern Radiological Health Laboratory (SWRHL), are presented.

SWRHL-95-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
FINAL REPORT OF OFF-SITE SURVEILLANCE FOR THE MILROW EVENT, OCTOBER 2, 1969.

Jun 70, 22p

Descriptors: (*Nuclear explosions, *Radioactive contaminants), (*Amchitka Island, Nuclear explosions).
Identifiers: *Milrow shot.

Amchitka Island, a member of the Rat Island group in the Aleutian Islands, was first used for an underground nuclear test on October 29, 1965, by the Department of Defense. A second underground test, called the Milrow Event, was conducted by the Atomic Energy Commission at Amchitka on October 2, 1969. The operational procedures and results of the Public Health Service, Southwestern Radiological Health Laboratory off-site radiological safety and community information programs provided for Milrow are presented. (Author)

SWRHL-96
Southwestern Radiological Health Lab., Las Vegas, Nev.
PUBLIC HEALTH EVALUATION, PROJECT RULISON (PRODUCTION TESTING),
Roy B. Evans, and David E. Bernhardt. May 70, 87p Phep-1, Pne-R-34

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Rulison operation, Plowshare operation.

Project Rulison is a PLOWSHARE EXPERIMENT TO INVESTIGATE THE FEASIBILITY OF NUCLEAR EXPLOSIVE STIMULATION OF NATURAL GAS PRODUCTION. The detonation of the explosive took place on September 10, 1969. Production testing activities will be initiated six months or more after the detonation and will entail flaring of natural gas containing radioactivity. The radionuclides of primary interest that will be released by production testing are tritium and 85Kr. An analysis of the public health implications of the radioactivity releases associated with Project Rulison production testing is presented.

SWRHL-97-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JANUARY THROUGH JUNE 1969.

Feb 71, 41p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).

During the period January through June 1969, eleven announced nuclear detonations were conducted at the Atomic Energy Commission's Nevada Test Site. None of these events released radioactive material that was detected off-site. One power run of a nuclear reactor rocket engine at the Nuclear Rocket Development Station on June 11, 1969, released gaseous fission products that were detected on one air sampler at the Diablo Highway Maintenance Station on Highway 25. The concentration of 131I, determined from the combined results of the particulate and charcoal filters from this location, was 0.7 pCi/cu m. Some radioactive material from Project Schooner of December 8, 1968, was resuspended from material deposited on and off-site. This material was occasionally found on air samples through March 1969. No domestic water or milk samples collected during this period contained fresh fission products. Exposure to the off-site population during this period was well below the safety criteria established by the Atomic Energy Commission. (Author)

SWRHL-98-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
OFF-SITE SURVEILLANCE ACTIVITIES OF THE SOUTHWESTERN RADIOLOGICAL HEALTH LABORATORY FROM JULY-DECEMBER 1969.
Feb 71, 67p

Descriptors: (*Nuclear explosions, *Radioactive contaminants).

During the period July through December 1969, fifteen announced underground nuclear tests were conducted by the U. S. Atomic Energy Commission at the Nevada Test Site, and two events, Project Rulison and Project Milrow, were conducted in Colorado and Alaska. One event, Pod, conducted on October 29, 1969, was detected by GM survey instruments only at Lathrop Wells, Nevada. The peak reading was 0.04 mR/hr net gamma. One power run of the XE-Prime nuclear rocket engine did release radioactivity to the off-site areas. The maximum gross gamma exposure rate measured by portable survey instruments was 0.04 mR/hr. The maximum integrated concentration of 131I on an air sample was 0.45 micro Ci-sec/cu m. No milk or domestic water sampled showed fresh fission products. All off-site exposures were well below the safety criteria established by the Atomic Energy Commission. (Author)

SWRHL-99-r
Southwestern Radiological Health Lab., Las Vegas, Nev.
REPORT OF OFF-SITE SURVEILANCE FOR PROJECT GASBUGGY, MARCH 1967-JUNE 1968.
Feb 70, 44p PNE-G-61

Descriptors: (*Nuclear explosions, *Radioactive contaminants).
Identifiers: *Gasbuggy operation.

The Southwestern Radiological Health Laboratory (SWRHL) began off-site radiological safety operations for Project Gasbuggy in June 1967. A census was taken during the following three months of all people and milk cows within 100 miles of the Gasbuggy site. All mining and tunneling operations within 50 miles were also located. The collection of environmental samples to establish background levels of radioactivity was started in early August 1967, when milk and water samples were collected. Vegetation samples for background information were collected in early December 1967. Milk and water samples were collected following the shot and the drill-back operations to find if radiation levels had increased.

TID-21764
Southwestern Radiological Health Lab., Las Vegas, Nev.
DAIRY FARM RADIOIODINE STUDY FOLLOWING THE PIKE EVENT,
Delbert S. Barth, and Joel G. Veater. 23 Nov 64, 44p

Descriptors: (*Cattle, *Radioactive contaminants), (*Iodine isotopes, Cattle), (*Dairy cattle, *Radiobiology).
Identifiers: *Pike shot.

For abstract, see 73 01.

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(W71-10633, , EPA-WQO-15080-EUU-10/70)
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PB-209 934 13B

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PB-218 511 13B

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(W70-04004, , FWPCA-DAST-16)
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PB-215 375 13B

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(APTD-0889)
PB-205 256 14B

BSR-3322
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(EPA-R2-72-092)
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PB-191 396 14B

BENDIX RESEARCH LABS., SOUTH FIELD, MICH.

RLD-6179
Steam Car Control Analysis.
PB-217 634 21G

BENDIX RESEARCH LABS., SOUTHFIELD, MICH.

RLD-6213
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PB-211 376 13B

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(W71-00620, , FWPCA-14010-EIZ-01/70)
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PB-214 553/0 13B

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PB-201 133 21D

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PB-205 892 13B
PB-205 893 7C
PB-205 935 13B
PB-211 265 7B

CPA-70-42
National Academy of Sciences-National Research Council, Washington, D.C. Div. of Medical Sciences.
PB-207 535 6F

CPA-70-44
Southwest Research Inst., San Antonio, Tex. Dept. of Automotive Research.
PB-203 994 13B
PB-204 012 13B

CPA-70-45
Radian Corp., Austin, Tex.
PB-211 748 7A
PB-211 750 7A
Radiation Corp., Austin, Tex.
PB-211 749 7A

CPA-70-46
Esso Research Centre, Abingdon (England).
PB-211 438 7A

CPA-70-48
National Research Council, Washington, D.C. Committees on Pollution Abatement and Control.
PB-208 100 13B
PB-211 961 13B

CPA-70-50
Scientific Research Instruments Corp., Baltimore, Md.
PB-211 481 21D

CPA-70-57
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Toxicology.
PB-199 903 6T
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Toxicology.
PB-199 904 6T
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Toxicology.
PB-203 464 6T
National Academy of Sciences-National Research Council, Washington, D.C. Committee on Toxicology.
PB-203 465 6T

CPA-70-59
Tyco Labs., Inc., Waltham, Mass.
PB-210 651 7A

CPA-70-62
Center for the Environment and Man, Inc., Hartford, Conn.
PB-206 939 13B

CPA-70-66
West Virginia Univ., Morgantown. Coal Research Bureau.
PB-213 639/8 13B

CPA-70-67
Little (Arthur D.), Inc., Cambridge, Mass.
PB-204 989 13B

CPA-70-68
Kellogg (M. W.) Co., Piscataway, N.J.
PB-213 421/1 7A
Kellogg (M. W.) Co., Piscataway, N.J. Research and Engineering Development.
PB-204 711 7A
PB-206 963 8G
PB-211 431 7A

CPA-70-72
ITT Electro-Physics Labs., Inc., Columbia, Md.
PB-204 183 9C

CPA-70-76
Singmaster and Breyer, New York.
PB-207 190 7A

CPA-70-78
Atomics International, Canoga Park, Calif.
PB-203 466 7A

CPA-70-79
AeroChem Research Labs., Inc., Princeton, N.J.
PB-209 837 14B

CPA-70-86
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-198 453 13B

CPA-70-90
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
PB-210 739 13B
PB-211 480 21B

CPA-70-91
California State Dept. of Agriculture, Sacramento. Bureau of Plant Pathology.
PB-200 873 13B

CPA-70-94
Geomet, Inc., Rockville, Md.
PB-206 951 13B

CPA-70-95
A.P.T., Inc., Riverside, Calif.
PB-213 016/9 7A
PB-213 017/7 7A

CPA-70-100
Voorhees (Alan M.) and Associates, Inc., McLean, Va.
PB-207 111 13B

CPA-70-101
Research Triangle Inst., Durham, N.C.
PB-204 444 13B

CPA-70-103
Pennsylvania State Univ., University Park. Center for Air Environment Studies.
PB-204 356 17H

CPA-70-111
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-204 385 7A

CPA-70-116
Copley International Corp., New York.
PB-205 936 13B

CPA-70-117
Oregon State Univ., Corvallis.
PB-212 739/7 13B
Oregon State Univ., Corvallis. Water Resources Research Inst.
PB-201 409 13B

CPA-70-121
Battelle Columbus Labs., Ohio.
PB-209 259 13B

CPA-70-122
Pacific Environmental Services, Inc., Santa Monica, Calif.
PB-211 916 13B
PB-213 008/6 13B
PB-213 009/4 13B
PB-213 010/2 13B

CPA-70-124
PEDCo-Environmental Specialists, Inc. Cincinnati, Ohio.
PB-204 650 13B

CPA-70-130
Washington State Univ., Pullman. Coll. of Engineering.
PB-210 583 13B

CPA-70-145
Syracuse Univ. Research Corp., N.Y. Life Sciences Div.
PB-214 008/5 13B
PB-214 009/3 13B

CPA-70-146
Applied Technology Corp., Pittsburgh, Pa.
PB-211 888 7A

CPA-70-147
Research Triangle Inst., Durham, N.C. Statistics Research Div.
PB-203 072 13H

CPA-70-149
Southern Research Inst., Birmingham, Ala.
PB-212 607 7A

CPA-70-152
Akron Scientific Labs., Berkeley, Calif.
PB-213 846/7 7B

CPA-70-155
Research Corp. of New England, Hartford, Conn.
PB-206 823 13B
PB-206 938 13B

CPA-70-165
Walden Research Corp., Cambridge, Mass.
PB-213 294/2 7A

CPA-70-170
Dynasciences Corp., Chatsworth, Calif. Instrument Systems Div.
PB-210 266 14B

CPA-70-173
Stanford Research Inst., Menlo Park, Calif.
PB-212 530 13B

CPE-69-3
Midwest Research Inst., Kansas City, Mo.
PB-214 152/1 13B

CPE-69-114
National Association of Counties Research Foundation, Washington, D.C.
PB-214 092/9 13B

CPE-70-124
Union Carbide Corp., Bound Brook, N.J. Chemicals and Plastics.
PB-213 488/0 13B

CPE-70-136
Greenleaf/Telesca, Miami, Fla.
PB-216 234 13B

DAAK02-67-C-0488
Iowa State Univ., Ames. Engineering Research Inst.
PB-217 427 7A
PB-217 461 7A
PB-217 602 7A

DAAK02-67-C-0488
Iowa State Univ., Ames. Engineering Research Inst.
PB-217 677 7A
PB-217 678 7A

DI-14-01-0001-499
Consolidated Controls Copr., Bethel, Conn.
PB-216 138 10B

DI-14-01-0001-1093
Aerojet-General Corp., El Monte, Calif. Environmental Systems Div.
PB-206 019 7A

DI-14-01-0001-2161
Bechtel Corp., San Francisco, Calif.
PB-217 761 13B

DI-14-01-001-3142
Wisconsin Univ., Madison. Water Resources Center.
PB-209 895 6F

DI-14-01-201
Robert S. Kerr Water Research Center, Ada, Okla.
PB-214 113/3 8H

DI-14-06-200-3389A
California State Dept. of Water Resources, Fresno. San Joaquin District.
PB-217 840 13B

DI-14-12-10
Federal Water Pollution Control Administration, Washington, D.C.
PB-217 994 13B

DI-14-12-26
Hittman Associates, Inc., Columbia, Md.
PB-195 160 13B

DI-14-12-27
Havens and Emerson, Cleveland, Ohio.
PB-195 083 13B

DI-14-12-31
Halliburton Co., Duncan, Okla.
PB-216 238 13B
PB-216 249 13B

DI-14-12-39
Hercules, Inc., Cumberland, Md. Allegany Ballistics Lab.
PB-187 867 13B

DI-14-12-40
Rex Chainbelt, Inc., Milwaukee, Wis. Ecology Div.
PB-215 695/8 13B

DI-14-12-52
Rocketdyne, Canoga Park, Calif. Chemical and Material Sciences Dept.
PB-187 755 13B

DI-14-12-58
Kansas Univ., Lawrence. Center for Research in Engineering Science.
PB-215 388 13B

DI-14-12-65
American Public Works Association, Chicago, Ill. Research Foundation.
PB-214 469/9 13B

DI-14-12-97
Ohio State Univ. Research Foundation, Columbus.
PB-214 771/8 13B

DI-14-12-103
Wichita State Univ., Kansas. Dept. of Economics.
PB-216 137 13B

DI-14-12-104
IIT Research Inst., Chicago, Ill.
PB-216 122 13B

DI-14-12-105
Swindell-Dressler Co., Pittsburgh, Pa.
PB-190 167 13B
PB-190 168 13B

DI-14-12-133
Melpar, Falls Church, Va.
PB-197 669 13B

DI-14-12-138
Abt Associates, Inc., Cambridge, Mass.
PB-216 336 13B

DI-14-12-139
Underwater Storage, Inc., Washington, D.C.
PB-191 217 13B

DI-14-12-146
Western Co., Richardson, Tex.
PB-216 386 13B

DI-14-12-187
Avco Economic Systems Corp., Washington, D.C.
PB-195 281 13B

DI-14-12-405
Dynatech Corp., Cambridge, Mass.
PB-217 673 13B
PB-218 416 13B

DI-14-12-408
Utah State Univ., Logan.
PB-204 817 13B

DI-14-12-413
Battelle-Northwest, Richland, Wash.
PB-218 511 13B

DI-14-12-416
General American Transportation Corp., Niles, Ill. General American Research Div.
PB-190 170 13B

DI-14-12-422
Water Resources Engineers, Inc., Walnut Creek, Calif.
PB-210 126 8H

DI-14-12-430
Standard Brands Chemical Industries, Inc., Dover, Del.
PB-217 985 13B

DI-14-12-433
IIT Research Inst., Chicago.
PB-190 169 13B

DI-14-12-456
American Public Works Association, Chicago, Ill.
PB-216 142 13B
American Public Works Association, Chicago, Ill. Research Foundation.
PB-215 902 13B

DI-14-12-461
Engineering-Science, Inc./Texas, Austin.
PB-192 310 13B

DI-14-12-487
Envirogenics Co., El Monte, Calif.
PB-203 069 13B

DI-14-12-490
Ionics, Inc., Watertown, Mass.
PB-215 688/3 13B

DI-14-12-493
Underwater Storage, Inc., Washington, D.C.
PB-188 505 13B

DI-14-12-500
MELPAR, Falls Church, Va.
PB-190 193 13B

DI-14-12-527
Gulf South Research Inst., New Iberia, La.
PB-198 221 13B

DI-14-12-529
Black, Sivalls and Bryson, Inc., Pittsburgh, Pa. Applied Technology Div.
PB-202 571 13B

DI-14-12-530
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
PB-191 712 13B

DI-14-12-531
Midwest Research Inst., Kansas City, Mo.
PB-202 230 13B

DI-14-12-550
American Public Works Association, Chicago, Ill. Research Foundation.
PB-200 827 13B

DI-14-12-560
Tyco Labs., Inc., Waltham, Mass.
PB-198 427 13B

DI-14-12-562
Grumman Aerospace Corp., Bethpage, N.Y.
PB-203 598 13B

DI-14-12-575
IIT Research Inst., Chicago, Ill.
PB-198 222 11K

DI-14-12-582
Bechtel Corp., San Francisco, Calif.
PB-215 516 13B

DI-14-12-587
North Star Research and Development Inst., Minneapolis, Minn.
PB-202 237 13B

DI-14-12-592
Federal Water Pollution Control Administration, Washington, D.C.
PB-216 232 13B

DI-14-12-595
Envirogenics Co., El Monte, Calif.
PB-198 227 13B

DI-14-12-596
Aerojet-General Corp., El Monte, Calif. Environmental Systems Div.
PB-198 224 6F

DI-14-12-811
URS Research Co., San Mateo, Calif.
PB-191 711 13B

DI-14-12-814
Dow Chemical Co., Freeport, Tex. Texas Div.
PB-218 273 6F

DI-14-12-823
Beck (R.W.) and Associates, Denver, Colo.
PB-206 954 13A

DI-14-12-838
Brookhaven National Lab., Upton, N.Y.
PB-198 225 13B

DI-14-12-887
Culligan International Co., Northbrook, Ill.
PB-214 454/1 13B

DI-14-12-904
Franklin Inst. Research Labs., Philadelphia, Pa.
PB-198 229 8H

PB-198 312 8H

DI-14-12-908
Rex Chainbelt, Inc., Milwaukee, Wis.
PB-214 103/4 13B

DI-14-12-921
URS Research Co., San Mateo, Calif.
PB-214 408/7 13B

DI-14-12-926
Chemstrand Research Center, Inc., Durham, N.C.
PB-214 605/8 7A

DI-14-12-928
Swindell-Dressler Co., Pittsburgh, Pa.
PB-214 552/2 7A

DI-14-12-930
Burns and Roe, Inc., Oradell, N.J.
PB-214 551/4 13B

DI-14-12-933
Weston (Roy F.), Inc., West Chester, Pa.
PB-214 550/6 13B

DI-14-12-936
Black and Veatch, Kansas City, Mo.
PB-214 553/0 13B

DI-14-13-31
Halliburton Co., Duncan, Okla.
PB-217 688 13B

DI-68-01-0063
Stanley Consultants, Cleveland, Ohio.
PB-206 232 13B

DI-68-02-0048
TRW Systems Group, McLean, Va. Washington Operations.
PB-205 251 13B

PB-205 252 13B

PB-205 253 13B

TRW Systems, Redondo Beach, Calif.
PB-207 700 13B

DI-68-02-0085
Northern Research and Engineering Corp., Cambridge, Mass.
PB-208 950 13B

DI-68-04-0039
CONSAD Research Corp., Pittsburgh, Pa.
PB-207 319 5C

PB-207 320 13B

DI-68-04-0046
Wyle Labs., Inc., El Segundo, Calif.
PB-208 660 13B

DL-41-2-001-27
North Star Research and Development Inst., Minneapolis, Minn.
PB-212 562 5I

DL-81-37-70-18
Ohio State Univ., Columbus. Center for Human Resource Research.
PB-208 328 5I

DOI-UI-00170
Environmental Protection Agency, Washington, D.C.
PB-213 596/1 13B

DOT-UT-2
Twin Cities Area Metropolitan Transit Commission, St. Paul, Minn.
PB-195 844 13F

EAP-68-002-0018
Massachusetts Inst. of Tech., Cambridge. Dept. of Electrical Engineering.
PB-205 187 7A

EHS-70-116
Northern Research and Engineering Corp., Cambridge, Mass.
PB-206 005 21B

EHS-70-126
Institute of Public Administration, Washington, D.C.
PB-203 111 13B

PB-207 109 13B

EHSD-71-03
Hittman Associates, Inc., Columbia, Md.
PB-207 108 13B

EP-00161
Manhattan Coll., Bronx, N.Y. Dept. of Civil Engineering.
PB-215 722/0 13B

EP-00162
Drexel Univ., Philadelphia, Pa.
PB-209 000 13B

PB-209 001 13B

PB-209 002 13B

EP-00325
Battelle Columbus Labs., Ohio.
PB-213 378/3 13B

EP-00325-51
Battelle Columbus Labs., Ohio.
PB-213 378/3 13B

EPA-APCO-68-04-0039
CONSAD Research Corp., Pittsburgh, Pa.
PB-203 084 13B

EPA-APCO-70-69
Institute of Gas Technology, Chicago, Ill.
PB-201 410 20D

EPA-APO-A-501
Bureau of Mines, Pittsburgh, Pa. Div. of Fossil Fuels.
PB-201 465 5B

EPA-CPA-68-02-0050
Bonner and Moore Associates, Inc., Houston, Tex.
PB-201 133 21D

EPA-CPA-68-04-0029
General Motors Corp., Indianapolis, Ind. Detroit Diesel Allison Div.
PB-202 961 13B

EPA-CPA-70-4
TRW Systems Group, Redondo Beach, Calif.
PB-209 479 21B

TRW Systems, Redondo Beach, Calif.
PB-209 886 14E

EPA-CPA-70-19
Esso Research and Engineering Co., Linden, N.J. Government Research Div.
PB-198 822 7A

Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
PB-210 246 7A

EPA-CPA-70-28
Battelle Columbus Labs., Ohio.
PB-209 476 21G

EPA-CPA-70-46
Esso Research Centre, Abingdon (England).
PB-202 221 7A

EPA-CPA-70-63
General Technologies Corp., Reston, Va.
PB-201 422 7D

EPA-CPA-70-68
Kellogg (M.W.) Co., Piscataway, N.J. Research and Engineering Development.
PB-198 817 21D

EPA-CPA-70-100
Voorhees (Alan M.) and Associates, Inc., McLean, Va.
PB-204 870 13B

EPA-CPA-70-124
PEDCo-Environmental Specialists, Inc., Cincinnati, Ohio.
PB-203 502 13B

EPA-CPA-70-135
Research Triangle Inst., Durham, N.C. Statistics Research Div.
PB-203 356 6E

EPA-CPA-70-159
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-201 738 13B

EPA-CPA-70-169
Massachusetts Inst. of Tech., Cambridge.
PB-199 479 13B

EPA-CPE-69-140
Snell (Foster D.), Inc., Florham Park, N.J.
PB-202 202 13B

EPA-EHS-70-109
Southwest Research Inst., San Antonio, Tex.
PB-212 796/7 13B

EPA-EHS-70-111
General Electric Co., Schenectady, N.Y. Mechanical Engineering Lab.
PB-209 277 13F

PB-209 278 13F

EPA-EHS-70-126
Institute of Public Administration, Washington, D.C.
PB-203 952 13B

EPA-EHSD-71-3
Shell Development Co., Emeryville, Calif.
PB-212 560 7A

EPA-EHSD-71-5
Radian Corp., Austin, Tex.
PB-211 035 7A

PB-211 058 7A

EPA-EHSD-71-6
Little (Arthur D.), Inc., Cambridge, Mass.
PB-210 382 21B

EPA-EHSD-71-7
TRW Systems Group, Redondo beach, Calif.
PB-204 863 21D

EPA-EHSD-71-8
General Electric Co., Syracuse, N. Y. Electronics Lab.
PB-210 671 13B

EPA-EHSD-71-9
Envirogenics Co., El Monte, Calif.
PB-207 701 13B

EPA-EHSD-71-13
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
PB-208 993 5C

EPA-EHSD-71-14
TRW Systems Group, McLean, Va. Washington Operations.
PB-207 596 13B

PB-209 647 13B

EPA-EHSD-71-15
Consolidated Coal Co., Library, Pa. Research Div.
PB-214 162/0 21D

EPA-EHSD-71-18
Little (Arthur D.), Inc., Cambridge, Mass.
PB-204 421 21B

EPA-EHSD-71-22
General Research Corp., Santa Barbara, Calif.
PB-203 872 13B

EPA-EHSD-71-24
Cottrell Environmental Systems, Inc., Bound Brook, N.J.
PB-209 023 7A

EPA-EHSD-71-30
Monsanto Research Corp., Dayton, Ohio. Dayton, Lab.
PB-204 877 14B

EPA-EHSD-71-34
Lockheed-Georgia Co., Marietta.
PB-206 950 14E

EPA-EHSD-71-36
Engineering-Science, Inc., Washington, D.C.
PB-204 861 13B

EPA-EHSD-71-43
Hittman Associates, Inc., Columbia, Md.
PB-209 257 21D
PB-209 266 10B
PB-209 283 18E
PB-209 285 21D

EPA-EHSH-70-101
Dow Chemical Co., Midland, Mich. Organic Chemicals Dept.
PB-207 312 13B

EPA-EHSH-70-102
Thermo Electron Corp., Waltham, Mass. Research and Development Center.
PB-210 836 21G
PB-210 837 21G

EPA-EHSH-70-103
Oklahoma State Univ., Stillwater. School of Mechanical and Aerospace Engineering.
PB-205 815 21B

EPA-EHSH-70-114
Solar, San Diego, Calif.
PB-204 011 13B

EPA-EHSH-70-122
Bendix Research Labs., Southfield, Mich.
PB-211 376 13B

EPA-EHSH-70-123
AiResearch Mfg. Co., Los Angeles, Calif.
PB-208 237 13A

EPA-EHSH-71-002
TRW Systems Group, Redondo Beach, Calif.
PB-203 463 13F

EPA-R-800 878
American Inst. of Crop Ecology, Silver Spring, Md.
PB-212 736 7A

EPA-R-800878
American Inst. of Crop Ecology, Silver Spring, Md
PB-209 945 13B
PB-211 074 13B
PB-211 466 13B
PB-212 599 13B
PB-214 264-T 13B

EPA-R-801343
National Center for Voluntary Action, Washington, D.C.
PB-214 186/9 13B

EPA-WP-01823-03
Kansas Univ./Center for Research, Inc., Lawrence.
PB-208 349 13B

EPA-WP-01468-01
Syracuse Univ., N.Y. Dept. of Chemical Engineering and Materials Science.
PB-213 938/4 13B

EPA-WQO-3-111-1
Springfield Sanitary District, Ill.
PB-200 828 13B

EPA-WQO-14-06-200-3309A
California State Dept. of Water Resources, Fresno. San Joaquin District.
PB-205 425 13B

EPA-WQO-14-12-147
Baltimore City, Md.
PB-199 363 13B

EPA-WQO-14-12-407
Metcalf and Eddy, Inc., Boston, Mass.
PB-208 815 13B

EPA-WQO-14-12-412
Cordis Corp., Miami, Fla.
PB-203 426 6A

EPA-WQO-14-12-417
McDonnell Douglas Astronautics Co., Newport Branch, Calif. Astropower Lab.
PB-203 206 13B

EPA-WQO-14-12-546
Rocketdyne, Canoga Park, Calif. Research Div.
PB-203 597 13B

EPA-WQO-14-12-550
American Public Works Association, Chicago, Ill. Research Foundation.
PB-203 208 13B

EPA-WQO-14-12-553
Envirogenics Co., El Monte, Calif.
PB-199 362 13B

EPA-WQO-14-12-840
Synectics Corp., Allison Park, Pa.
PB-206 146 13B

EPA-WQO-14-12-849
Stochastics, Inc., Blacksburg, Va.
PB-203 427 13B

EPA-WQO-14-12-883
Atlantic Research Systems Div., Costa Mesa, Calif. Marine Systems.
PB-205 208 13B

EPA-WQO-14-12-885
Envirogenics Co., El Monte, Calif.
PB-207 645 13B

EPA-WQO-14-12-886
Little (Arthur D.), Inc., Cambridge, Mass.
PB-206 193 13B

EPA-WQO-14-12-902
Abt Associates, Inc., Cambridge, Mass.
PB-207 350 13B

EPA-6H-02-0124
Environmental Measurements, Inc., San Francisco, Calif.
PB-210 717 13B
PB-212 423 13B

EPA-12-14-477
Dynatech Corp., Cambridge, Mass.
PB-206 816 13B

EPA-13-WASH-1
Seattle Metropolitan Municipality, Wash.
PB-209 861 13B

EPA-14-12-107
MSA Research Corp., Evans City, Pa.
PB-208 205 7A

EPA-14-12-128
Portland Dept. of Public Works, Oreg. Bureau of Sanitary Engineering.
PB-206 814 13B

EPA-14-12-143
Rohrer (Karl R.) Associates, Inc., Akron, Ohio.
PB-208 346 13B

EPA-14-12-188
Envirogenics Co., El Monte, Calif.
PB-213 118/3 13B

EPA-14-12-195
American Process Equipment Corp., Hawthorne, Calif.
PB-212 421 13B

EPA-14-12-419
Biospherics Inc., Rockville, Md.
PB-211 127 13B

EPA-14-12-462
Black and Veatch, Kansas City, Mo.
PB-211 132 13B
PB-213 895/7 13B

EPA-14-12-469
MSA Research Corp., Evans City, Pa.
PB-208 205 7A

EPA-14-12-513
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
PB-203 489 13B

EPA-14-12-518
Catalytic, Inc., Philadelphia, Pa.
PB-213 720/8 13B

EPA-14-12-521
Littleton Research and Engineering Corp., Mass.
PB-206 817 13A

EPA-14-12-522
General Electric Co., Philadelphia, Pa. Re-entry and Environmental Systems Div.
PB-208 345 13B

EPA-14-12-534
California Univ., Santa Barbara. Dept. of Biological Sciences.
PB-212 782/7 8A

EPA-14-12-572
Southern Illinois Univ., Carbondale.
PB-208 348 13B

EPA-14-12-576
Littleton Research and Engineering Corp., Mass.
PB-206 218 8H

EPA-14-12-589
Ohio State Univ. Research Foundation, Columbus.
PB-213 887/7 13B

EPA-14-12-593
United Aircraft Research Labs., East Hartford, Conn.
PB-211 283 10B

EPA-14-12-809
Meloy Labs., Inc., Springfield, Va.
PB-214 419/4 13B

EPA-14-12-815
Uniroyal, Inc., Wayne, N.J.
PB-208 821 7A

EPA-14-12-827
Battelle Columbus Labs., Ohio.
PB-211 280 14B

EPA-14-12-835
Southwest Research Inst., San Antonio, Tex.
PB-213 442/7 13C

EPA-14-12-859
Tyco Labs., Waltham, Mass.
PB-208 820 7A

EPA-14-12-860
Alpine Geophysical Associates, Inc., Norwood, N.J.
PB-203 497 13B

EPA-14-12-861
Minnesota Univ., Minneapolis. St. Anthony Falls Hydraulic Lab.
PB-213 443/5 13B

EPA-14-12-863
Bowles Fluidics Corp., Silver Spring, Md.
PB-210 808 14B

EPA-14-12-871
Biospherics Inc., Rockville, Md.
PB-211 127 13B

EPA-14-12-876
Horizons, Inc., Cleveland, Ohio.
PB-208 411 13B

EPA-14-12-884
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
PB-203 498 13B

EPA-14-12-888
Westinghouse Ocean Research Lab., Annapolis, Md.
PB-211 183 8A

EPA-14-12-903
New Mexico State Univ., University Park. Physical Science Lab.
PB-213 441/9 13B

EPA-14-12-929
Black, Sivalls and Bryson, Inc., Pittsburgh, Pa. Applied Technology Div.
PB-203 488 7A

EPA-14-12-959
Envirometrics, Inc., Washington, D.C.
PB-211 143 13B
PB-211 146 13B
Environmetrics, Inc., Washington, D.C.
PB-211 147 13B
PB-213 657/0 5K

EPA-68-01-0004
National Water Well Association, Columbus, Ohio.
PB-214 614/0 13B

EPA-68-01-0007
Battelle Columbus Labs., Ohio.
PB-213 210/8 6T

EPA-68-01-0038
Midwest Research Inst., Kansas City, Mo.
PB-214 764/3 14B

EPA-68-01-0049
Ayres, Lewis, Norris and May, Inc., Ann Arbor, Mich.

PB-214 531/6 13B

EPA-68-01-0062
Geophysical Survey Systems, Inc., North Billerica, Mass.
PB-213 892/0 13B

EPA-68-01-0082
National Environmental Research Center, Cincinnati, Ohio. Analytical Quality Control Lab.
PB-213 900/0 7C

EPA-68-01-0086
Advanced Technology Center, Inc., Dallas, Tex.
PB-211 250 8H

EPA-68-01-0087
Robert S. Kerr Water Research Center, Ada, Okla.
PB-213 771/6 13B

EPA-68-01-0088
Battelle Columbus Labs., Ohio.
PB-214 688/4 13B

EPA-68-01-0119
Environmental Protection Agency, Washington, D.C. Office of Water Programs.
PB-213 960/7 13B

EPA-68-01-0125
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
PB-217 990 6F

EPA-68-01-0145
Earth Satellite Corp., Washington, D.C.
PB-214 400/4 13B

EPA-68-01-0157
Informatics, Inc., Bethesda, Md.
PB-206 721 13B

PB-206 722 6S

EPA-68-01-0161
Franklin Inst. Research Labs., Philadelphia, Pa.
PB-214 411/1 13B

EPA-68-01-0174
Stanford Research Inst., Menlo Park, Calif.
PB-214 074/7 13B

EPA-68-01-0406
General Electric Co., Cincinnati, Oh. . Space Div.
PB-213 370/0 21E

EPA-68-01-0407
Garrett Corp., Los Angeles, Calif. AiResearch Mfg. Div.
PB-214 527/4 21G

EPA-68-02-0013
Philco-Ford Corp., Newport Beach, Calif. Aeronutronic Div.
PB-203 523 7B

EPA-68-02-0014
Aeronautical Research Associates of Princeton, Inc., N.J.
PB-211 897 4A

EPA-68-002-018
Massachusetts Dept. of Tech., Cambridge. Dept. of Electrical Engineering.
PB-205 188 7A

Massachusetts Inst. of Tech., Cambridge. Dept. of Chemical Engineering.
PB-211 853 7A

EPA-68-02-0032
Flow Labs., Inc., Rockville, Md.
PB-206 822 6M

EPA-68-02-0038
Lockheed Missiles and Space Co., Sunnyvale, Calif. Biotechnology.
PB-212 715 7E

EPA-68-02-0044
PEDCo-ENVIRONMENTAL, Cincinnati, Ohio.
PB-205 469 13B

PB-205 470 13B

PB-214 911/0 13B

PB-214 977/1 13B

PEDCo-Environmental Specialist, Inc. Cincinnati, Ohio.
PB-205 476 13B

PEDCo-Environmental Specialists, Inc. Cincinnati, Ohio.
PB-207 309 13B

EPA-68-02-0048
Institute of Public Administration, Washington, D.C.
PB-213 374/2 13B

TRW, Inc., McLean, Va. Transportation and Environmental Operations.
PB-214 176/0 13B

TRW Systems Group, McLean, Va. Washington Operations.
PB-204 363 13B

PB-205 179 13B

TRW Systems Group, Redondo Beach, Calif.
PB-208 329 13B

PB-208 330 13B

PB-208 332 13B

PB-208 333 13B

PB-208 336 13B

PB-208 337 13B

TRW Systems System, Redondo Beach, Calif.
PB-208 331 13B

EPA-68-02-0049
Walden Research Corp., Cambridge, Mass.
PB-212 606 13B

EPA-68-02-0050-3
Bonner and Moore Associates, Inc., Houston, Tex.
PB-203 953 13B

EPA-68-02-0076
Valentine, Fisher and Tomlinson, Seattle, Wash.
PB-210 137 13B

EPA-68-02-0078
Rutgers - The State Univ., New Bruswick, N.J. Dept. of Biology.
PB-214 160/4 2B

EPA-68-02-0079
Research Corp. of New England, Hartford, Conn.
PB-210 716 13B

EPA-68-02-0084
Massachusetts Univ., Waltham. Suburban Experiment Station.
PB-214 161/2 2B

EPA-68-02-0093
General Electric Co., Philadelphia, Pa. Space Div.
PB-210 672 13B

EPA-68-02-0099
Little (Arthur D.), Inc., Cambridge, Mass.
PB-213 313/0 7B

EPA-68-02-0100
Davis (W. E.) and Associates, Leakwood, Kans.
PB-210 677 13B

Davis (W. E.) and Associates, Leawood, Kans.
PB-210 676 13B

PB-210 678 13B

PB-210 679 13B

PB-210 680 13B

EPA-68-02-0207
Stanford Research Inst., Menlo Park, Calif.
PB-210 017 13B

PB-210 018 13B

PB-210 019 13B

PB-210 020 13B

EPA-68-02-0208
IIT Research Inst., Chicago, Ill.
PB-211 504 8D

EPA-68-02-0210
Industrial Nucleonics Corp., Columbus, Ohio.
PB-209 954 14B

EPA-68-02-0211
PEDCo-Environmental Specialists, Inc., Cincinnati, Ohio.
PB-214 179/4 13B

EPA-68-02-0219
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
PB-212 812/2 13B

EPA-68-02-0220
Esso Research and Engineering Co., Linden, N. J. Government Research Lab.
PB-212 858/5 7A

PB-214 053/1 7A

EPA-68-02-0241
Catalytic, Inc., Charlotte, N.C.
PB-208 944 7A

PB-213 297/5 13B

EPA-68-02-0248
Mitre Corp., McLean, Va.
PB-213 498/9 13B

EPA-68-02-0249
Bendix Aerospace Systems Div., Ann Arbor, Mich.
PB-212 625 7D

EPA-68-02-0257
Research Triangle Inst., Durham, N.C.
PB-212 478 13B

EPA-68-02-0260
Fats and Proteins Research Foundation, Inc., Des Plaines, Ill.
PB-213 386/6 7A

EPA-68-02-0269
Nevada Univ., Reno. Center for Water Resources Research.
PB-212 561 13B

EPA-68-02-0308
TRW Systems Group, Redondo Beach, Calif.
PB-213 263/7 14B

EPA-68-02-0309
Environmental Research Corp., St. Paul, Minn.
PB-212 741/3 13B

EPA-68-02-0331
Gordian Associates, Inc., New York.
PB-210 670 13B

EPA-68-02-0334
University of Southern California, Los Angeles. Dept. of Medicine.
PB-213 834/1 6P

EPA-68-02-0341
TraDet, Inc., Columbus, Ohio.
PB-211 215 13B

EPA-68-03-0038
Research Triangle Inst., Durham, N.C.
PB-213 341/1 13B

EPA-68-03-0059
National Analysts, Inc., Philadelphia, Pa.
PB-213 340/3 13B

EPA-68-04-0001
Purdue Univ., Lafayette, Ind. Combustion Lab.
PB-212 844/5 21E

EPA-68-04-0011
Northern Research and Engineering Corp., Cambridge, Mass.
PB-204 878 13B

EPA-68-04-0012
AiResearch Mfg. Co. of Arizona, Phoenix.
PB-213 389/0 21E

EPA-68-04-0013
United Aircraft Research Labs., East Hartford, Conn.
PB-214 515/9 13F

EPA-68-04-0027
Pratt and Whitney Aircraft, East Hartford, Conn.
PB-207 321 13B

EPA-68-04-0028
TRW Systems Group, Redondo Beach, Calif.
PB-213 257/9 10C

EPA-68-04-0033
Mechanical Technology, Inc., Latham, N.Y.
PB-212 097 13F

EPA-68-04-0034
Sundstrand Aviation, Rockford, Ill.
PB-210 057 13F

EPA-68-04-0035
Teledyne Continental Motors, Muskegon, Mich.
PB-204 196 21B

EPA-68-04-0037
Scott Research Labs., Inc., Plumsteadville, Pa.
PB-207 107 13B

EPA-68-04-0040
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
PB-204 869 21B

PB-204 879 13B

EPA-68-04-0043
Commins (J. A.) and Associates, Inc., Fort Washington, Pa.
PB-209 291 13B

EPA-68-04-0047
Bolt Beranek and Newman, Inc., Cambridge, Mass.
PB-206 717 13B

EPA-68-04-0048
Lockheed Missiles and Space Co., Sunnyvale, Calif. Ground Vehicle Systems.
PB-213 342/9 13F

EPA-68-04-0058
TRW Systems Group, Redondo Beach, Calif.
PB-213 280/1 13F

EPA-69-01-0142
Midwest Research Inst., Kansas City, Mo.
PB-213 782/3 7A

EPA-70-64
State Univ. of New York, Scotia. Atmospheric Sciences Research Center.
PB-214 170/3 4A

EPA-71-26
Sperry Rand Research Center, Sudbury, Mass.
PB-214 184/4 4B

EPA-71-37
IIT Research Inst., Chicago, Ill.
PB-214 064/8 6E

EPA-71-44
Aerotherm Corp., Mountain View, Calif.
PB-214 002/8 14B

EPA-71-0106
SCS Engineers, Reston, Va.
PB-213 311/4 13B

EPA-00-04-68
Tulane Univ., New Orleans, La.
PB-211 282 13B

EQC-213
Earth Satellite Corp., Washington, D.C.
PB-211 399 13B

F04701-70-C-0059
Aerospace Corp., El Segundo, Calif. Office of Corporate Planning.
PB-209 480 13C

F19628-68-C-0365
Mitre Corp., McLean, Va.
PB-197 386 5B
PB-197 387 5B
PB-210 372 7A
PB-210 373 13B

F19628-70-C-0230
Massachusetts Inst. of Tech., Lexington. Lincoln Lab.
PB-214 240/5 7D

F19628-71-C-0002
Mitre Corp., Bailey's Crossroads, Va.
PB-20[illegible] 286 13F

FH-11-6845
American Academy of Arts and Sciences, Brookline, Mass.
PB-180 955 5C

FO4701-70-C-0059
Aerospace Corp., El Segundo, Calif.
PB-201 645 13F
PB-201 646 13F

FWCA-14-12-154
Johns-Manville Research and Engineering Center, Manville, N. J.
PB-196 734 13B

FWPA-14-12-538
Little (Arthur D.), Inc., Cambridge, Mass.
PB-208 987 13B
PB-208 988 13B

FWPA-14-12-551
TRACOR, Inc., Austin, Tex.
PB-206 807 8H

FWPA-14-12-823
Beck (R. W.) and Associates, Denver, Colo.
PB-210 778 13A

FWPCA-WA-66-19
Federal Water Quality Administration, Manassas, Va. Advanced Waste Treatment Research Lab.
PB-217 273 13B

FWPCA-WA-66-23
American Public Works Association, Chicago, Ill. Research Foundation.
PB-216 127 13B

FWPCA-WP-00027-03
Utah Univ., Salt Lake City. Inst. of Environmental Biological Research.
PB-217 058 13B

FWPCA-WP-36-01-02
West Virginia Univ., Morgantown. Dept. of Civil Engineering.
PB-217 057 13B

FWPCA-WP-00055
Alabama Univ., University.
PB-214 952 6C

FWPCA-WP-0081-06
Public Health Service, Washington, D.C.
PB-217 254 6F

FWPCA-WP-00083-03
Texas Univ., Austin. Center for Research in Water Resources.
PB-217 255 6M

FWPCA-WP-139-01
Michigan Univ., Ann Arbor. School of Public Health.
PB-216 752 13B

FWPCA-WP-00161
Cincinnati Univ., Ohio.
PB-216 366 7A

FWPCA-WP-00196
Iowa State Univ., Ames. Engineering Research Inst.
PB-217 427 7A
PB-217 461 7A
PB-217 602 7A
PB-217 678 7A

FWPCA-WP-00196-08
Florida Univ., Gainesville. Inst. of Food and Agricultural Sciences.
PB-217 488 13B

FWPCA-WP-00220-03
Rhode Island Univ., Kingston.
PB-214 929 13B

FWPCA-WP-00282
Federal Water Pollution Control Administration, Cincinnati, Ohio. Ohio Basin Region.
PB-214 926 6M

FWPCA-WP-229-03
Cornell Univ., Ithaca, N.Y. Dept. of Sanitary Engineering.
PB-215 578 7D

FWPCA-WP-229-04
Cornell Univ., Ithaca, N.Y. Dept. of Sanitary Engineering.
PB-215 579 7D

FWPCA-WP-00234-05
Cornell Univ., Ithaca, N.Y. Dept. of Sanitary Engineering.
PB-216 904 13B

FWPCA-WP-0243
Edison Water Quality Lab., N.J.
PB-217 284 13B

FWPCA-WP-00325
Oklahoma State Univ., Stillwater.
PB-216 956 6M

FWPCA-WP-334
Utah Univ., Salt Lake City. Dept. of Zoology and Entomology.
PB-215 287 6C

FWPCA-WP-00394
New Mexico State [illegible]niversity Park. Engineering Experiment Station.
PB-216 556 13B

FWPCA-WP-00457
Columbia Univ., New York. Dept. of Industrial Engineering.
PB-216 656 13B

FWPCA-WP-00457-01
Columbia Univ., New York.
PB-218 503 5C

FWPCA-WP-00512-5
Washington Univ., Seattle. Charles W. Harris Hydraulics Lab.
PB-190 800 13B

FWPCA-WP-00525
Pittsburgh Univ., Pa. Dept. of Biology.
PB-217 972 6F

FWPCA-WP-00544
California Univ., Berkeley. School of Public Health.
PB-217 472 13B
PB-217 473 7A

FWPCA-WP-00558
Washington Univ., Seattle. Dept. of Civil Engineering.
PB-215 322 13B

FWPCA-WP-00562-04
Maine Univ., Orono.
PB-215 012 7A

FWPCA-WP-00585-04
Northwestern Univ., Evanston, Ill. Dept. of Civil Engineering.
PB-214 997 6M

FWPCA-WP-00597-06
California Univ., Berkeley. Sanitary Engineering Research Lab.
PB-189 169 13B

FWPCA-WP-00645-01
Rutgers - The State Univ., New Brunswick, N. J. Dept. of Environmental Science.
PB-216 946 6M

FWPCA-WP-00646
Kansas Univ., Lawrence. Center for Research in Engineering Science.
PB-217 435 6M

FWPCA-WP-00658
California Univ., Berkeley. Sanitary Engineering Research Lab.
PB-217 153 7A

FWPCA-WP-00672
Arizona Agricultural Experiment Station, Tucson.
PB-216 941 8H

FWPCA-WP-00674
Michigan Univ., Ann Arbor. Dept. of Civil Engineering.
PB-216 926 8H

FWPCA-WP-00688-03
Texas Univ., Austin. Environmental Health Engineering Research Lab.
PB-216 749 6F

FWPCA-WP-00692
California Univ., Berkeley. Coll. of Engineering.
PB-216 495 13B

FWPCA-WP-00699
West Virginia Univ., Morgantown.
PB-215 855 7D

FWPCA-WP-00706
Michigan Univ., Ann Arbor. Div. of Sanitary and Water Resources Engineering.
PB-215 407 7A

FWPCA-WP-0071[illegible]
Massachusetts Inst. of Tech., Cambridge. Hydrodynamics Lab.
PB-215 374 8H

FWPCA-WP-00713-04
Ohio State Univ., Columbus. Dept. of Microbiology.
PB-217 636 6M

FWPCA-WP-00813-01
Ludwig Engineering and Science Research Foundation, Arcadia, Calif.
PB-211 374 7A
PB-215 599 13B

FWPCA-WP-00813-02
Ludwig Engineering and Science Research Foundation, Arcadia, Calif.
PB-211 374 7A

FWPCA-WP-00837
State Univ. of New York, Buffalo. Faculty of Engineering and Applied Sciences.
PB-195 544 8H
PB-195 545 8H

FWPCA-WP-00867
Syracuse Univ., N.Y. Dept. of Chemical Engineering and Metallurgy.
PB-217 601 7D

FWPCA-WP-883-03
Washington Univ., Seattle.
PB-217 786 13B
Washington Univ., Seattle. Dept. of Civil Engineering.
PB-202 580 13B

FWPCA-WP-00912-02
Georgia Inst. of Tech., Atlanta. Water Resources Center.
PB-216 461 20D

FWPCA-WP-00931
University of Southern California, Los Angeles. Allan Hancock Foundation.
PB-216 930 13B

FWPCA-WP-00931-03
University of Southern California, Los Angeles. Allan Hancock Foundation.
PB-217 157 8J

FWPCA-WP-00940
Toronto Univ. (Ontario). Great Lakes Inst.
PB-217 411 6F

FWPCA-WP-00952
California Univ., Davis.
PB-217 635 7E

FWPCA-WP-981
Maryland Univ., College Park. Dept. of Civil Engineering.
PB-216 550 7D

FWPCA-WP-00987
Winona State Coll., Minn.
PB-198 223 6F

FWPCA-WP-01001
New Mexico State Univ., University Park. Engineering Experiment Station.

PB-206 237 7A

FWPCA-WP-01834-01
Cornell Univ., Ithaca, N.Y. Dept. of Food Science.
PB-217 194 6M

FWPCA-WP-01887
Virginia Polytechnic Inst., Blacksburg. Water Resources Research Center.
PB-195 170 13B

FWPCA-WP-01181
Clemson Univ., S.C. Dept. of Environmental Systems Engineering.
PB-199 834 13B

FWPCA-WP-01194-01
Stanford Univ., Calif. Program in Engineering-Economic Planning.
PB-216 650 13B

FWPCA-WP-01198-01
San Diego County Public Health Lab., Calif.
PB-217 191 6M

FWPCA-WP-01239
Massachusetts Univ., Amherst. Dept. of Civil Engineering.
PB-217 252 13B

FWPCA-WP-01371-01-1A
Catholic Univ. of America, Washington, D.C. Dept. of Chemical Engineering.
PB-217 387 7A

FWPCA-WP-01371-01-A1
Catholic Univ. of America, Washington, D.C. Dept. of Chemical Engineering.
PB-217 193 7D

FWPCA-WP-01387-01
National Center for Research and Training in the Hydrologic and Hydraulic Aspects of Water Pollution Control, Nashville, Tenn.
PB-216 716 13B

FWPCA-WP-01408-01
Massachusetts Univ., Amherst. Environmental Engineering.
PB-216 746 7A

FWPCA-WP-01449-01
Texas Univ., Austin. Environmental Health Engineering Research Lab.
PB-216 551 13B

FWPCA-WP-01486-01
Washington Univ., Seattle. Dept. of Civil Engineering.
PB-189 232 13B

FWPCA-WP-01530
Virginia Cooperative Fishery Univ, Blacksburg.
PB-206 184 6F

FWPCA-WPD-82-02-66
Baffa (John J.), New York.
PB-217 912 13B

FWPCA-WPD-146-02-68
North Texas State Univ., Denton. Dept. of Biology.
PB-217 916 6M

FWPCA-WPRD-58-01-67
Coca-Cola Co., Orlando, Fla. Foods Div.
PB-202 238 13B

FWPCA-WPRD-53-01-67
District of Columbia Dept. of Sanitary Engineering, Washington.
PB-211 240 13B

FWPCA-WPRD-103-01-68
Cleveland, Ohio.
PB-217 628 13B

FWPCA-WPRD-215-01-68
American Oil Co., Mandan, N. Dak. Mandan Refinery.
PB-202 570 13B

FWPCA-12-14-677
Dynatech R/D Co., Cambridge, Mass.
PB-212 392 13A

FWPCA-14-12-11
Rhodes Technology Corp., Houston, Tex.
PB-189 775 13B

FWPCA-14-12-19
FMC Corp., Santa Clara, Calif. Central Engineering Labs.
PB-195 223 13B

FWPCA-14-12-23
Acoustica Associates, Inc., Los Angeles, Calif.
PB-201 745 13B

FWPCA-14-12-34
Allis-Chalmers Mfg. Co., Milwaukee, Wis. Research Div.
PB-201 701 13B

FWPCA-14-12-75
West Virginia Pulp and Paper Co., Covington.
PB-191 538 13B

FWPCA-14-12-88
Kansas Univ., Lawrence. Dept. of Civil Engineering.
PB-204 818 2C

FWPCA 14-12-107
MSA Research Corp., Evans City, Pa.
PB-189 955 7A

FWPCA-14-12-156
Bechtel Corp., San Francisco, Calif.
PB-189 756 13B

PB-189 758 13B

FWPCA-14-12-197
Envirogenics Co., El Monte, Calif.
PB-208 989 13B

FWPCA-14-12-208
Hayes, Seay, Mattern and Mattern, Roanoke, Va.
PB-195 201 13B

FWPCA-14-12-481
Burgess and Niple Ltd., Columbus, Ohio.
PB-195 162 13B

FWPCA-14-12-483
Weston (Roy F.), Inc., West Chester, Pa.
PB-203 680 13B

FWPCA-14-12-413
Battelle-Northwest, Richland, Wash. Pacific Northwest Lab.
PB-189 405 7A

FWPCA-14-12-415
General American Transportation Corp., Niles, Ill.
PB-189 295 13B

FWPCA-14-12-453
Halliburton Co., Duncan, Okla.
PB-196 110 8H

PB-196 736 13B

FWPCA-14-12-461
Engineering-Science, Inc./Texas, Austin.
PB-205 824 7A

FWPCA-14-12-474
Dow Chemical Co., Midland, Mich. Functional Products and Systems.
PB-211 909 13B

PB-211 910 13B

FWPCA-14-12-476
NUS Corp., Pittsburgh, Pa. Cyrus Wm. Rice Div.
PB-195 675 13B

FWPCA-14-12-490
Ionics, Inc., Watertown, Mass.
PB-211 243 7A

FWPCA-14-12-495
Resource Engineering Associates, Wilton, Conn.
PB-192 634 13B

FWPCA-14-12-500
Melpar, Falls Church, Va. Environmental and Applied Science Center.
PB-195 283 13B

FWPCA-14-12-501
Metcalf and Eddy, Inc., Palo Alto, Calif.
PB-203 289 13B

PB-203 290 13B

PB-203 291 13B

PB-203 292 13B

FWPCA-14-12-524
AiResearch Mfg. Co., Los Angeles, Calif.
PB-211 604 13B

FWPCA-14-12-542
EG and G Inc., Boulder, Colo. Environmental Services Operation.
PB-210 702 13B

FWPCA-14-12-566
Robert A Taft Water Research Center, Cincinnati, Ohio. Advanced Waste Treatment Research Lab.
PB-212 374 13B

FWPCA-14-12-569
Midwest Research Inst., Kansas City, Mo.
PB-211 246 13B

FWPCA-14-12-571
Florida Univ., Gainesville.
PB-206 145 13B

FWPCA-14-12-588
Engineering-Science, Inc./Texas, Austin.
PB-212 369 13B

FWPCA-14-12-598
O'Brien and Gere Engineers, Inc., Syracuse, N.Y.
PB-212 389 13B

FWPCA-14-12-880
Ionics, Inc., Watertown, Mass.
PB-204 526 13B

FWPCA-14-12-884
Texas Tech Univ., Lubbock. Dept. of Geosciences.
PB-203 681 8H

FWPCA-14-12-888
Dow Chemical Co., Walnut Creek, Calif.
PB-204 527 13B

FWPCA-14-12-810
Autotrol Corp., Milwaukee, Wis. Bio-Systems Div.
PB-211 463 13B

FWPCA-14-12-819
Engineering-Science, Inc., Cincinnati, Ohio.
PB-211 451 13B

FWPCA-14-12-858
Hydrotechnic Corp., New York.
PB-211 144 13B

FWPCA-14-12-862
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-204 820 13B

FWPCA-14-12-877
NUS Corp., Pittsburgh, Pa. Cyrus Wm. Rice Div.
PB-203 679 13B

FWPCA-14-12-895
Research Triangle Inst., Durham, N.C. Environmental Studies Center.
PB-211 244 13B

FWPCA-14-12-943
Battelle Columbus Labs., Ohio.
PB-212 393 11K

FWPCA-14-12-959
Envirometrics, Inc., Washington, D.C.
PB-210 703 13B

PB-210 855 13B

PB-210 859 13B

PB-210 860 13B

PB-210 861 13B

Environmetrics, Inc., Washington, D.C.
PB-212 007 13B

FWPCA-00196
Iowa State Univ., Ames. Engineering Research Inst.
PB-217 677 7A

FWPCA-01239-02
Massachusetts Univ., Amherst. Environmental Engineering.
PB-216 652 13B

PB-216 730 13B

FWPCA-01342-01A
New York Univ., Bronx. Dept. of Chemical Engineering.
PB-192 852 13B

FWPCA-11020
Hoffmann and Fiske, Boise, Idaho.
PB-187 868 13B

FWPCA-16010-DLC
Bituminous Coal Research, Inc., Monroeville, Pa.
PB-187 866 13B

FWPCA-16010-DYK
Rex Chainbelt, Inc., Milwaukee, Wis.
PB-195 200 13H

FWPCA-16010-EIZ
Bituminous Coal Research, Inc., Monroeville, Pa.
PB-195 282 13B

FWPCA-16010-FII
Carnegie-Mellon Univ., Pittsburgh, Pa.
PB-198 523 7D

FWPCA-16060-DDZ
Eastern Municipal Water District, Hemet, Calif.
PB-190 790 13B

PB-190 791 13B

FWQA-DI-14-12-048
NUS Corp., Pittsburgh, Pa. Cyrus Wm. Rice Div.
PB-197 594 13B

FWQA-WP-00524
Oregon State Univ., Corvallis. Dept. of Civil Engineering.
PB-198 232 13B

FWQA-1WP-01220
Rhode Island Univ., Kingston. Graduate School of Oceanography.
PB-192 853 13B

FWQA-14-12-113
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-197 892 7A

FWQA-14-12-136
Crane Co., King of Prussia, Pa. Cochrane Div.
PB-195 674 13B

FWQA-14-12-158
Atomics International, Canoga Park, Calif.
PB-196 737 13B

FWQA-14-12-171
Grace (W.R.) and Co., Chicago, Ill. Dearborn Chemical Div.
PB-196 739 13B

FWQA-14-12-181
Gulf General Atomic, Inc., San Diego, Calif.
PB-198 092 13B

FWQA-14-12-183
Atomics International, Canoga Park, Calif.
PB-196 738 13B

FWQA-14-12-184
Aerojet-General Corp., El Monte, Calif. Environmental Systems Div.
PB-197 659 13B

FWQA-14-12-194
Rex Chainbelt, Inc., Milwaukee, Wis.
PB-209 933 13B

FWQA-14-12-408
Infilco, Tucson, Ariz.
PB-197 890 13B

FWQA-14-12-410
Process Research, Inc., Cambridge, Mass.
PB-200 721 7A

FWQA-14-12-414
FMC Corp., Santa Clara, Calif. Central Engineering Labs.
PB-196 733 13B

FWQA-14-12-415
General American Transportation Corp., Niles, Ill.
PB-197 891 13B

FWQA-14-12-427
Envirogenics Co., El Monte, Calif.
PB-207 480 13B

FWQA-14-12-428
General Dynamics Corp., Groton, Conn. Electric Boat Div.
PB-197 599 13B

FWQA-14-12-439
Tyco Labs., Inc., Waltham, Mass.
PB-196 735 7C

FWQA-14-12-443
Southern Research Inst., Birmingham, Ala.
PB-206 191 13B

FWQA-14-12-452
Gulf General Atomic, Inc., San Diego, Calif.
PB-197 448 13B

FWQA-14-12-456
American Public Works Association, Chicago, Ill. Research Foundation.
PB-195 676 13B

FWQA-14-12-458
Black, Crow and Eidsness, Inc., Atlanta, Ga.
PB-201 725 13B

FWQA-14-12-466
FMC Corp., Santa Clara, Calif. Central Engineering Labs.
PB-210 858 13B

FWQA-14-12-470
Westinghouse Ocean Research Lab., San Diego, Calif.
PB-195 677 13B

FWQA-14-12-477
Dynatech Corp., Cambridge, Mass.
PB-208 036 13A

FWQA-14-12-485
Grace (W. R.) and Co., Clarksville, Md.
PB-196 740 13B

FWQA-14-12-492
Burns and Roe, Inc., Oradell, N.J.
PB-197 597 13B

FWQA-14-12-496
Horizons, Inc., Cleveland, Ohio.
PB-197 470 13B

FWQA-14-12-498
Envirogenics Co., El Monte, Calif.
PB-197 658 13B

FWQA-14-12-506
Uniroyal, Inc., Wayne, N. J. Research Center.
PB-201 700 13D

FWQA-14-12-526
Cornell Aeronautical Lab., Inc., Buffalo, N. Y.
PB-210 124 8H

FWQA-14-12-535
World Life Research Inst., Colton, Calif.
PB-206 476 6O

FWQA-14-12-561
Battelle-Northwest, Richland, Wash.
PB-209 934 13B

FWQA-14-12-568
Rocketdyne, Canoga Park, Calif.
PB-197 889 13B

FWQA-14-12-570
Tetra Tech, Inc., Pasadena, Calif.
PB-208 034 8H

FWQA-14-12-580
American Public Welfare Association, Chicago, Ill.
PB-203 962 13B

FWQA-14-12-581
Cecil (Lawrence K.) Tucson, Ariz.
PB-211 191 13B

FWQA-14-12-590
General Mills Chemicals, Inc., Minneapolis, Minn.
PB-205 360 7A

FWQA-14-12-599
Culligan International Co., Northbrook, Ill.
PB-209 935 13B

FWQA-14-12-612
Southern Research Inst., Birmingham, Ala.
PB-206 191 13B

FWQA-14-12-617
North American Rockwell Corp., Canoga Park, Calif. Atomics International Div.
PB-209 939 13B

FWQA-14-12-629
Weston (Roy F.), Inc., West Chester, Pa.
PB-197 598 13B

FWQA-14-12-666
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
PB-197 596 13B

FWQA-14-12-667
Union Carbide Corp., Tonawanda, N.Y. Linde Div.
PB-209 940 13B

FWQA-14-12-904
Franklin Inst. Research Labs., Philadelphia, Pa.
PB-198 228 13B

FWQA-14-12-918
General Dynamics Corp., Groton, Conn. Electric Boat Div.
PB-208 281 13B
PB-208 282 13B

FWQA-14-12-937
IIT Research Inst., Chicago, Ill.
PB-213 410/4 11K

FWQA-63-01-68
Bituminous Coal Research, Inc., Monroeville, Pa.
PB-195 282 13B

FWQA-16010-DKN
Mellon Inst., Pittsburgh, Pa.
PB-196 113 6M

FWQA-16030-DTL
National Association of Counties Research Foundation, Washington, D.C.
PB-196 111 8H

FWQA-16030-EAO
Georgia Univ., Athens. Dept. of Entomology.
PB-191 812 7D

G06-EC-00032
Illinois Univ., Urbana.
PB-213 939/5 13B

G06-EC-00033
Clemson Univ., S.C. Div. of Interdisciplinary Studies.
PB-213 547/4 13D

G06-EC-00080
Metropolitan Sanitary District of Greater Chicago, Ill.
PB-213 537/5 2D

G06-EC-00163
Metropolitan Sanitary District of Greater Chicago, Ill.
PB-213 697/7 13B

G06-EC-00164
ESCO/GREENLEAF, Los Angeles, Calif.
PB-213 132/4 13B
PB-213 133/2 13B
PB-213 134/0 13B
PB-213 135/8 13B

G06-EC-00172
Stone (Ralph) and Co., Inc., Los Angeles, Calif.
PB-212 590 13B

G06-EC-00194
Kinney (A. M.), Inc., Cincinnati, Ohio.
PB-213 646/3 13B

G06-EC-00210
Battelle Memorial Inst., Richland, Wash. Pacific Northwest Labs.
PB-212 589 13C

G06-EC-00260
California Univ., Berkeley. Sanitary Engineering Research Lab.
PB-213 576/3 13B

G06-EC-00271
Humboldt County Dept. of Public Works, Eureka, Calif.
PB-212 398 13B

G06-EC-00282
Battelle Columbus Labs., Ohio.
PB-212 729 13B
PB-212 730 13B
PB-212 731 13B

G06-EC-00298
Institute of Scrap Iron and Steel, Inc., Washington, D.C.
PB-213 577/1 11F

G06-EC-00312
Saint Louis City/Union Electric Co., Mo.
PB-213 534/2 13B

N00017-62-C-0084
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
PB-213 417/9 13F

NAPCA-68A-2405D
Harvard Univ., Cambridge, Mass. Lab. for Computer Graphics and Spatial Analysis.
PB-204 147 13B
PB-204 148 13B
PB-204 178 13B
PB-204 179 13B
PB-204 180 13B
PB-204 182 13B
PB-204 191 13B
PB-204 192 13B
PB-204 193 13B
PB-204 194 13B
PB-204 195 13B
PB-204 422 13B
PB-204 713 13B
PB-204 714 13B

NSF-GK-495
Columbia Univ., New York. Dept. of Industrial Engineering.
PB-216 656 13B
PB-216 939 7E

NSF-GK-824
Massachusetts Univ., Amherst. Dept. of Civil Engineering.
PB-217 252 13B
Massachusetts Univ., Amherst. Environmental Engineering.
PB-216 730 13B

NSF-GK-13081
Michigan Univ., Ann Arbor. Cavitation and Multiphase Flow Lab.
PB-197 684 20D

PH-14-12-547
Rocketdyne, Canoga Park, Calif.
PB-211 264 13B

PH-22-68-11
MSA Research Corp., Evans City, Pa.
PB-203 061 7A

PH-22-68-12
Monsanto Research Corp., Dayton, Ohio. Dayton Lab.
PB-198 810 7A
Monsanto Research Corp., Dayton, Ohio. Dayton Lab.
PB-198 808 7A
PB-198 809 7A

PH-[illegible]-68-18
West Virginia Univ., Morgantown. Coal Research Bureau.
PB-196 779 7A

PH-22-68-23
Southwest Research Inst., San Antonio, Tex.
PB-207 851 13B

PH-22-68-24
Allied Chemical Corp., Morristown, N.J. Industrial Chemicals Div.
PB-198 407 7A
PB-198 408 7A

PH-22-68-25
Litton Systems, Inc., Bethesda, Md. Environmental Systems Div.
PB-188 067 13B
PB-188 068 13B
PB-188 069 13B
PB-188 070 13B
PB-188 071 13B
PB-188 072 13B
PB-188 073 13B
PB-188 074 13B
PB-188 075 13B
PB-188 076 13B
PB-188 077 13B
PB-188 078 13B
PB-188 079 13B
PB-188 080 13B
PB-188 081 13B
PB-188 083 13B
PB-188 084 13B
PB-188 085 13B
PB-188 086 13B
PB-188 087 13B
PB-188 088 13B
PB-188 089 13B
PB-188 090 13B
PB-188 091 13B
PB-188 092 13B
PB-188 093 13B

PH-22-68-30
Research Triangle Inst., Durham, N.C.
PB-209 662 13B

PH-[illegible]-68-31
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Programs.
PB-201 456 13B
PB-201 457 13B
PB-201 458 13B

PH-22-68-35
Stanford Research Inst., Menlo Park, Calif.
PB-192 478 9A

PH-22-68-40
Callery Chemical Co., Pa.
PB-193 483 7A

PH-22-68-46
TRW Systems Group, Redondo Beach, Calif.
PB-206 907 7A

PH-22-68-51
Air Preheater Co., Inc., Wellsville, N.Y.
PB-194 196 7A

PH-22-68-59
McNally Pittsburg Mfg. Corp., Kans.
PB-196 631 8I
PB-196 632 8I
PB-196 633 8I
PB-196 634 8I

PH-22-68-58
TRW Systems Group, McLean, Va. Washington Operation.
PB-203 067 13B
TRW Systems Group, McLean, Va. Washington Operations.
PB-202 345 13B
PB-202 353 13B
PB-203 063 13B
PB-203 127 13B
TRW Systems Group, Washington, D.C. Washington Operations.
PB-198 299 13B
PB-198 300 13B

PH-27-66-54
City Coll., New York. Dept. of Chemistry.
PB-192 224 13B
City Coll. of the City of New York.
PB-174 707 13B

PH-36-66-107
Harvard Univ., Cambridge, Mass.
PB-189 233 8I

PH-86-63-14
Florida State Board of Health, Bartow. Div. of Radiological and Occupational Health.
PB-189 344 6L

PH-86-63-36
Esso Research and Engineering Co., Linden, N.J. Process Research Div.
PB-214 902 13B

PH-86-63-140
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
PB-217 667 13B

PH-86-63-38
Syracuse Univ., N.Y. Dept. of Chemical Engineering and Metallurgy.
PB-217 807 13B

PH-86-63-75
Resources Research, Inc., Washington, D.C.
PB-217 159 13B

PH-86-63-92
National Planning Associates, Washington, D. C.
PB-217 805 5C

PH-86-63-93
Robinette Research Labs., Inc., Berwyn, Pa.
PB-215 471 13B

PH-86-63-120
Chemical Separations Corp., Oak Ridge, Tenn.
PB-217 455 7A

PH-86-64-39
Federal Water Pollution Control Administration, Cincinnati, Ohio.
PB-187 862 13B

PH-86-65-14
Los Angeles County Sanitation District, Calif.
PB-217 161 13B

PH-86-65-31
North American Aviation, Inc., Downey, Calif. Space and Information Systems Div.
PB-215 399 13B

PH-86-65-125
Hydroscience, Inc., Leonia, N.J.
PB-216 922 13B

PH-86-66-37
Los Angeles County Sanitation District, Calif.
PB-217 161 13B

PH-86-66-63
Kansas Univ./Center for Research, Inc.
PB-217 915 8H
Kansas Univ., Lawrence. Center for Research in Engineering Science.
PB-217 895 8H

PH-86-66-93
Southwest Research Inst., San Antonio, Tex.
PB-208 937 13B

PH-86-66-151
Aerojet-General Corp., Azusa, Calif. Life Systems Div.
PB-216 480 6E

PH-86-66-153
Bureau of Radiological Health, Rockville, Md. Div. Medical Radiation Exposure.
PB-204 930 6L

PH-86-66-160
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-216 653 13B

PH-86-66-168
Texas Nuclear Corp., Austin.
PB-189 362 20G

PH-86-67-15
Stanford Research Inst., Menlo Park, Calif.
PB-188 619 6R

PH-86-67-46
Eberline Instrument Corp., Santa Fe, N. Mex.
PB-189 141 13L

PH-86-67-72
Southwest Research Inst., San Antonio, Tex.
PB-207 850 13B

PH-86-67-73
Pittsburgh Univ., Pa. Graduate School of Public Health.
PB-195 888 6S

PH-86-67-100
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.
PB-204 404 13B

PH-86-67-108
Little (Arthur D.), Inc., Cambridge, Mass.
PB-194 814 13F

PH-86-67-109
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-192 321 13F

PH-86-67-114
Midwest Research Inst., Kansas City, Mo.
PB-203 621 13B
PB-204 405 13D

PH-86-67-115
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-196 749 7A

PH-86-67-129
Grace (W.R.) and Co., Baltimore, Md. Davison Chemical Div.
PB-199 428 7A

PH-86-67-139
Bituminous Coal Research, Inc., Monroeville, Pa.
PB-193 486 21D

PH-86-67-162
Georgia Univ., Athens.
PB-215 661 5I

PH-86-67-167
National Research Council, Washington, D.C. Building Research Advisory Board.
PB-197 623 13B

PH-86-67-193
Brobeck (William M.) Associates, Berkeley, Calif.
PB-182 335 20G

PH-86-67-198
Missouri Univ., Columbia.
PB-184 130 6L

PH-86-67-204
Ionics, Inc., Cambridge, Mass.
PB-217 834 13B

PH-86-67-206
Illinois State Geological Survey, Urbana.
PB-205 952 8I

PH-86-67-248
National Research Council, Washington, D.C. Committees on Pollution Abatement and Control.
PB-216 654 13B

PH-86-67-248
Stone (Ralph) and Co., Inc., Los Angeles, Calif.
PB-217 820 13B

PH-86-67-254
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
PB-216 341 13B

PH-86-67-265
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-204 922 13B

PH-86-67-274
IIT Research Inst., Chicago, Ill.
PB-214 032/5 7C

PH-86-67-290
National Association of Counties Research Foundation, Washington, D.C.
PB-214 039/0 13B

PH-86-68-48
Princeton Chemical Research, Inc., N.J.
PB-200 071 7A

PH-86-68-65
Scientific Research Instruments Corp., Baltimore, Md.
PB-211 338 7D

PH-86-68-66
New York Univ., N.Y. Research Div.
PB-206 820 13B
PH-86-68-74
Uniroyal, Inc., Wayne, N.J. Research Center.
PB-193 727 7A
PH-86-68-77
Envirogenics Co., El Monte, Calif.
PB-196 780 7A
PB-196 781 7A
PH-86-68-84
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-203 358 7A
PB-214 260/2 21B
PH-86-68-86
Kellogg (M. W.) Co., Piscataway, N.J. Research and Engineering Development.
PB-200 881 7A
PB-200 882 7A
PH-86-68-94
Sign X Labs., Inc., Essex, Conn.
PB-202 268 13B
PH-86-68-98
URS Research Co., San Mateo, Calif.
PB-214 760/1 13B
PH-86-68-152
Louisiana State Univ., Baton Rouge. Dept. of Chemical Engineering.
PB-203 620 6H
PH-86-68-187
Stanford Research Inst., Irvine, Calif.
PB-214 133/1 13B
PH-86-68-166
Stanford Research Inst., Menlo Park, Calif.
PB-213 444/3 13B
PH-86-68-203
Dillingham Corp., La Jolla, Calif. Applied Oceanography Div.
PB-213 473/2 13B
PH-86-68-206
TRW Systems Group, Redondo Beach, Calif.
PB-214 031/7 7A
PH-86-68-208
UNIROYAL, Inc., Naugatuck, Conn. UNIROYAL Chemical Div.
PB-203 619 13B
PHS-AP-00449
Alaska Univ., College. Geophysical Inst.
PB-196 977 4B
PHS-AP-00786
American Inst. of Crop Ecology, Silver Spring, Md.
PB-198 527 13B
PB-200 996 13B
PB-201 459 13B
PHS-AP-00786-01
American Inst. of Crop Ecology, Silver Spring, Md.
PB-198 061 13B
PB-198 062 13B
PB-198 063 13B
PB-198 064 13B
PB-198 410 13B
PHS-AP-00839
Minnesota Univ., Minneapolis. Particle Technology Lab.
PB-198 816 13B
PHS-AP-77741-02
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
PB-201 736 20C
PHS-CPA-22-68-91
Olson Labs., Inc., Dearborn, Mich.
PB-194 145 21B
PHS-CPA-22-69-5
Industrial Gas Cleaning Inst., Inc., Rye, N.Y.
PB-196 028 13B
PHS-CPA-22-69-14
Research Corp. of New England, Hartford, Conn.
PB-195 338 13B
PHS-CPA-22-69-37
National Research Council, Washington, D.C. Committees on Pollution Abatement and Control.
PB-192 887 13B
PHS-CPA-22-69-37
Pennsylvania State Univ., University Park. Center for Air Environment Studies.
PB-192 220 13B
PHS-CPA-22-69-43
Stanford Research Inst., Irvine, Calif.
PB-195 433 6C
PHS-CPA-22-69-50
Copley International Corp., New York.
PB-194 376 13B
PB-194 377 13B
PHS-CPA-22-69-51-HEW
Michigan Univ., Ann Arbor. Dept. of Mechanical Engineering.
PB-198 079 21B
PHS-CPA-22-69-52
California Univ., Riverside. Dept. of Economics.
PB-197 668 13B
PHS-CPA-22-69-59
National Air Pollution Control Administration Technical Center, Durham, N.C.
PB-194 136 7D
PHS-CPA-22-69-62
Avco Everett Research Lab., Everett, Mass.
PB-198 204 13B
PHS-CPA-22-69-64
Stanford Research Inst., Menlo Park, Calif.
PB-196 003 13B
PHS-CPA-22-69-68
Esso Research and Engineering Co., Linden, N. J. Government Research Lab.
PB-196 841 13B
PHS-CPA-22-69-70
Consolidated Engineering Technology Corp., Mountain View, Calif.
PB-194 688 21B
PHS-CPA-22-69-72
Graphic Arts Technical Foundation, Pittsburgh, Pa.
PB-195 770 13B
PHS-CPA-22-69-73
Southern Research Inst., Birmingham, Ala.
PB-196 379 13B
PB-196 380 13B
PB-196 381 13B
PB-198 150 13I
PHS-CPA-22-69-78
Stanford Research Inst., Menlo Park, Calif.
PB-197 028 7A
PB-197 166 7A
PB-197 167 7A
PB-197 168 7A
PHS-CPA-22-69-82
General Technologies Corp., Reston, Va.
PB-193 420 7A
PHS-CPA-22-69-84
Williams Research Corp., Walled Lake, Mich.
PB-193 479 21B
PHS-CPA-22-69-98
IIT Research Inst., Chicago, Ill.
PB-198 072 21B
PHS-CPA-22-69-101
Wisconsin Univ., Madison. Space Sciences Engineering Center.
PB-198 821 13B
PHS-CPA-22-69-123
Dunlap and Associates, Inc., Darien, Conn.
PB-195 257 6N
PHS-CPA-22-69-127
Research Triangle Inst., Durham, N.C.
PB-191 054 13B
PHS-CPA-22-69-128
Marquardt Co., Van Nuys, Calif.
PB-193 417 21G
PHS-CPA-22-69-131
Davis (W. E.) and Associates, Leawood, Kans.
PB-192 250 13B
PB-192 251 13B
PB-192 252 13B
PHS-CPA-22-69-132
Thermo Electron Corp., Waltham, Mass.
PB-193 418 21G
PHS-CPA-22-69-145
Dow Chemical Co., Midland, Mich. Organic Chemicals Dept.
PB-196 783 21B
PHS-CPA-22-69-147
Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
PB-198 066 13B
PHS-CPA-22-69-155
Center for the Environment and Man, Inc., Hartford, Conn.
PB-193 801 13B
PHS-CPA-69-528
City Coll., New York. Dept. of Chemistry.
PB-192 224 13B
PHS-CPA-70-4
TRW Systems Group, Redondo Beach, Calif.
PB-196 499 14E
PHS-CPA-70-6
Scott Research Labs., Inc., Plumsteadville, Pa.
PB-194 064 13B
PHS-CPA-70-14
Cincinnati Univ., Ohio. Kettering Lab.
PB-196 767 6E
PHS-CPA-70-18
Industrial Gas Cleaning Inst., Inc., Rye, N.Y.
PB-196 028 13B
PHS-CPA-70-27
Research Triangle Inst., Durham, N.C.
PB-198 065 14B
PHS-CPA-70-29
Resources Research, Inc., Washington, D.C.
PB-195 758 13B
PB-195 759 13B
PB-195 760 13B
PHS-CPA-70-60
Research Triangle Inst., Durham, N.C. Operations Research and Economics Div.
PB-197 547 13B
PB-198 779 13B
PB-198 780 13B
PHS-CPA-70-66
West Virginia Univ., Morgantown. Coal Research Bureau.
PB-196 779 7A
PHS-CPA-70-150
Industrial Gas Cleaning Inst., Inc., Rye, N.Y.
PB-198 137 13B
PHS-CPE-R-69-01
Baylor Univ., Houston, Tex. Coll. of Medicine.
PB-187 697 6R
PHS-CPE-R-69-23
Bureau of Radiological Health, Rockville, Md.
PB-192 748 14B
PHS-CPE-R-69-28
Bendix Corp., Southfield, Mich. Bendix Research Labs.
PB-191 396 14B
PHS-CPE-R-70-0048
Little (Arthur D.), Inc., Cambridge, Mass.
PB-214 045/7 13B
PHS-CPE-69-005
Environmental Health Service, Rockville, Md.
PB-194 410 5A
PB-194 411 5B
PB-194 412 6F
PB-194 413 6F
PB-194 414 5A
PHS-EC-00005
Kentucky Dept. of Health, Frankfort.
PB-215 903 13B
PHS-EC-00006
Illinois State Geological Survey, Urbana.
PB-214 028/3 8H
PHS-EC-00007
Louisville Univ., Ky. Inst. of Industrial Research.
PB-217 958 13B
PHS-EC-00061
San Diego City, Calif.
PB-214 960/7 13B
PHS-EC-00195
Metcalf and Eddy, Inc., Boston, Mass.
PB-214 166/1 13B

PHS-EC-00260
California Univ., Berkeley. Coll. of Engineering.
PB-216 191 13B
California Univ., Berkeley.
PB-218 265 13B

PHS-EC-00263
Bureau of Solid Waste Management, Cincinnati, Ohio.
PB-216 735 13B

PHS-EC-00292
Great Lakes Research Inst., Erie, Pa.
PB-208 674 13B

PHS-EC-00309
Johns Hopkins Univ., Baltimore, Md. Dept. of Geography and Environmental Engineering.
PB-216 105 13B

PHS-EC-00324
California Univ., Davis.
PB-215 328/6 13B

PHS-ES-00199
Cincinnati Univ., Ohio. Kettering Lab.
PB-[illegible] 767 6E

PHS-RG-4694
Manhattan Coll., Bronx, N. Y. Dept. of Civil Engineering.
PB-215 475 7D

PHS-RG-4784
Oregon State Univ., Corvallis. Engineering Experiment Station.
PB-215 603 13B

PHS-RG-7263
California Inst. of Tech., Pasadena.
PB-214 870 6E

PHS-RG-7748
Johns Hopkins Univ., Baltimore, Md. Dept. of Sanitary Engineering and Water Resources.
PB-214 920 6T

PHS-S-23
Minnesota Univ., Minneapolis. Dept. of Mechanical Engineering.
PB-216 861 20G

PHS-UI-00008
California State Dept. of Public Health, Berkeley.
PB-214 019/2 13B

PHS-UI-00014
Oregon State Board of Health, Salem.
PB-216 354 13B

PHS-UI-00018
Stone (Ralph) and Co., Inc., Los Angeles. Calif.
PB-216 754 13B

PHS-UI-00026
Quad-City Solid Wastes Committee, Paterson, N.J.
PB-217 244 13B

PHS-UI-00039
Carollo (John) Engineers, Lafayette, Calif.
PB-215 699 13B

PHS-UI-00041
Henningson, Durham and Richardson, Inc., Omaha, Nebr.
PB-2[illegible] 882/2 13B

PHS-UI-00046
Consumer Protection and Environmental Health Service, Washington, D.C.
PB-217 036 13B

PHS-UI-00068
Bureau of Solid Waste Management, Cincinnati, Ohio.
PB-216 663 13B

PHS-UI-00073
Consumer Protection and Environmental Health Service, Washington, D.C.
PB-217 05? 13B

PHS-UI-00076
Consumer Protection and Environmental Health Service, Washington, D.C.
PB-217 062 13B

PHS-UI-00095
Thomas, Dean and Hoskins, Inc., Great Falls, Mont.
PB-216 104 13B

PHS-UI-00187
Management Technology, Inc., Washington, D.C.
PB-216 117 13B

PHS-UI-00516
Drexel Inst. of Tech., Philadelphia, Pa.
PB-215 904 13B

PHS-UI-00518-00
University of Southern California, Los Angeles. Dept. of Civil Engineering.
PB-196 148 13B

PHS-UI-00539
Johns Hopkins Univ., Baltimore, Md.
PB-218 417 13B

PHS-UI-00547
California Univ., Berkeley.
PB-218 265 13B

PHS-UI-00699
Northwestern Univ., Evanston, Ill.
PB-208 154 13B

PHS-WP-13
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
PB-215 857 13B

PHS-WP-00018
Illinois Univ., Urbana. Dept. of Civil Engineering.
PB-216 925 13B

PHS-WP-00020-04
Humbolt State Coll., Arcata Calif.
PB-217 041 13B

PHS-WP-00026-R3
California Univ., Berkeley. Inst. of Engineering Research.
PB-217 027 13B

PHS-WP-00027
Utah Univ., Salt Lake City. Inst. of Environmental Biological Research.
PB-216 938 13B

PHS-WP-41
Newark Coll. of Engineering, N. J. Dept. of Civil Engineering.
PB-215 082 13B

PHS-WP-0079
Oregon State Univ., Corvallis. Dept. of Chemistry.
PB-214 988 7C

PHS-WP-90
Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
PB-215 857 13B

PHS-WP-00161
Cincinnati Univ., Ohio.
PB-217 289 7A

PHS-WP-185
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